AUGUSTUS PULLIS.

1839.

50 YEARS' EXPERIENCE.

THOMAS R. PULLIS.

1889.

# PULLIS BROS.

# Mississippi Iron Works AND Foundry.

**WAREROOMS, 206 AND 208 N. SIXTH STREET,**

**WORKS, Seventh, Eighth and Hickory Streets,**

ST. LOUIS, MO.

# DESCRIPTIVE CATALOGUE

OF

# ARCHITECTURAL, ORNAMENTAL AND STRUCTURAL

## IRON WORK.

Our Friends and Customers unacquainted with the City, and desirous of visiting us at the Foundry, can readily do so by observing the following directions: Take a Fifth Street Car going South, and stop at the corner of Seventh and Hickory Streets: or take a Car at Sixth and Market going South, and stop at corner of Seventh and Hickory Streets: or take a Fourth Street Car going South, stop at corner of Chouteau Avenue and Seventh Street, go South to corner of Seventh and Hickory, where our works are located. Our Sixth Street Office is central and can be found easily.

SAINT LOUIS:
LEVISON & BLYTHE STATIONERY COMPANY.
1889.

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# IRON AND ITS USES.

IRON, the most useful of metals, is found in great abundance in nearly all the Northern and Western States; but the largest and most accessible deposits are found in Missouri, a half day's journey from St. Louis—we refer to the well-known Iron Mountain and Pilot Knob—the ore of which, especially the former, is eagerly sought after by all manufacturers on account of its toughness and strength, qualities which it possesses in a far greater degree than any ore known. For Castings, subject to a cross strain, such as Girders, Lintels, etc., its equal has never been found.

The ores which are generally worked in the production of Iron are oxides and carbonates, or those containing the metal in a state of combination either with oxygen or oxygen and carbonic acid. It is found also, in large quantities, in combination with sulphur, forming the compound known as pyrites, and occasionally in combination with other substances. After it has undergone the various preparatory processes of roasting, crushing, smelting, refining, puddling, hammering and rolling, it is freed from earthy particles, and made malleable, tough and difficult of fusion, it is then fit for use. The forms which it takes according to the proportion of carbon with which it is combined, are Cast Iron, Wrought Iron and Steel.

The uses of this metal are manifold. In the construction of railroads, vessels, bridges, aqueducts, warehouses, stores, dwellings, art-palaces, furniture, pavements and other things without number, Iron is a most facile and serviceable material. "It accommodates itself," says Dr. Ure, "to all our wants, our desires, and even our caprices. It is equally serviceable to the arts, the sciences, to agriculture and war. The same ore furnishes the sword, the ploughshare, the pruning hook, the needle, the graver, the spring of a watch or of a carriage, the chisel, the chain, the anchor, the compass, the cannon and the bomb. It is a medicine of much virtue, and the only metal friendly to the human frame. The ores of Iron are scattered over the crust of the globe with a beneficent profusion proportioned to the utility of the metal. They are found under every latitude, every zone, and in every mineral formation. But, though Iron is the most common of the metals, it is by far the most difficult to obtain in a state fit for use, and the discovery of the method of working it seems to have been posterior to the use of gold, silver and copper.

"It would be vain to attempt to investigate the steps by which men were at first led to practice the processes required to fuse it and render it malleable; but that the invention of these curious arts is of a very early date is evident from the fact that Tubal Cain, but a short time after the creation, was 'an instructor of every artificer in brass and iron.' In most instances the profane historians of antiquity have either attributed the discovery of Iron and its uses to their divinities, or they have deified those to whom they supposed they owed the blessings of so valuable a discovery."

When we think of the services that Iron has rendered, whether in the form of tools for dressing stone and wood for buildings, or of machines for the manufacturing of innumerable articles of domestic utility, or any of its varied uses in mechanics, it seems to have contributed more than anything else to facilitate the advancement of mankind in the career of improvement.

The great value of Iron as a material for building purposes consists in its lightness, strength and durability. It can be cast or wrought into almost every imaginable form. The weight it is able to sustain on the space of a square foot or inch can be exactly calculated, and the precise quality of the iron suited to any intended use can be easily selected. For delicate and ornamental work, a soft and very fluid iron will be best; while for girders and castings exposed to a cross strain it should be more tenacious. For bed-plates and castings, which have merely to sustain a compressing force, the hardness of the metal is the principal quality required.

Constructed with nice calculation and care, a building may be made of iron so as to combine great strength with economy of material and space, together with general beauty and cheerfulness of effect. It is usual to make the exterior front with stories of arcades, or in such a manner that each story shall have its columns or pilasters with their appropriate entablatures, the inter-columniations being filled with glass. A heavy cornice, supported by brackets or modillions, crowns the whole, to which, occasionally, a pediment is added. In the interior the floors are supported by cast-iron columns arranged in rows, across the tops of which run ornamental girders. Each girder is a cast-iron arch, the lower ends of which are connected by a rod of wrought iron called the tension rod, which acts as a tie-beam to prevent the ends from spreading beneath any heavy pressure. Upon the girders rest the ends of a range of wrought iron beams, which extend from one row of pillars to another. These beams have broad flanges on their lower sides, so that they can support a series of flat arches of brick, which extend from one beam to another, and form a solid basis for a floor. To make a level surface above the arches, the spandrels may be filled with concrete, and then a brick, stone, iron or wood floor laid, as may be desired. With all the stories constructed in this manner, and connected with each other by iron stairways, with sheet-iron doors and windows, having their frames, sashes and shutters of iron, and with the roof also of the same material, a building may be so constructed as to possess great strength and durability, and be as near fire-proof as possible.

Iron, as a building material, is now beginning to be much appreciated and used in Europe and in this country—not only for warehouses, banks and printing establishments it is eminently suitable, but also for the interior construction and decoration of public libraries, large halls, or any building which has floors or galleries requiring to be strongly supported, and which is of great importance to keep safe from the ravages of fire. Cast in forms of tasteful design, representing foliage or carved work, and richly painted or gilded, Iron is exceedingly ornamental. In public buildings, where all the room is wanted, and everything which tends to obstruct the view is to be avoided as far as possible, delicate iron columns, with fluted shafts and Corinthian capitals, are sufficient for the support of the great weight above, and leave nearly all the space for use. Iron is very suitable for balustrades before windows, and on flights of steps, balconies and terraces, being lighter and more economical than stone. For window caps, sills and cornices also, Iron is much used in brick and stone fronts, and when painted and sanded, has the ornate and massive appearance of carved stone. For steps on the outside, and also the inside of many buildings, iron is a better material than stone or wood; it takes up less room, is more durable and furnishes a better foothold. It is a decided improvement on wooden steps which are to be much traveled over to screw on plates of iron with a roughened surface.

**PULLIS BROTHERS.**

# READ THIS ARTICLE.

Parties ordering work of any kind, are respectfully requested to **Carefully read the Article** on the class of work they contemplate ordering, as it will be found to contain **Practical Hints** that will lead to the order being sent in a clear and intelligible manner, an important point in having orders by mail carried out **correctly.**

Our facilities for manufacturing Iron Work are such that we are enabled to turn out all orders intrusted to us **more rapidly than most houses,** still we would call your attention to the fact that in ordering **Iron Work for Buildings,** it is of the first importance that you order it **in time.** The manufacture of Architectural Iron Work is, from the very nature of the material used, necessarily a slow process, and no matter how high the standard of work sent out by a concern, a hurried job is never as well executed as one on which a proper amount of time has been spent in rendering it correct in all particulars. We would, therefore, urge the necessity, if possible, of your deciding upon and ordering your work, especially all work needed in the **construction** of your building, before you begin to break ground. It is certainly far preferable to have your Iron Work in readiness, even a month before needing it, than to wait to order until within a short time before you require it, and then suffer vexatious delays, stoppage of work, etc.

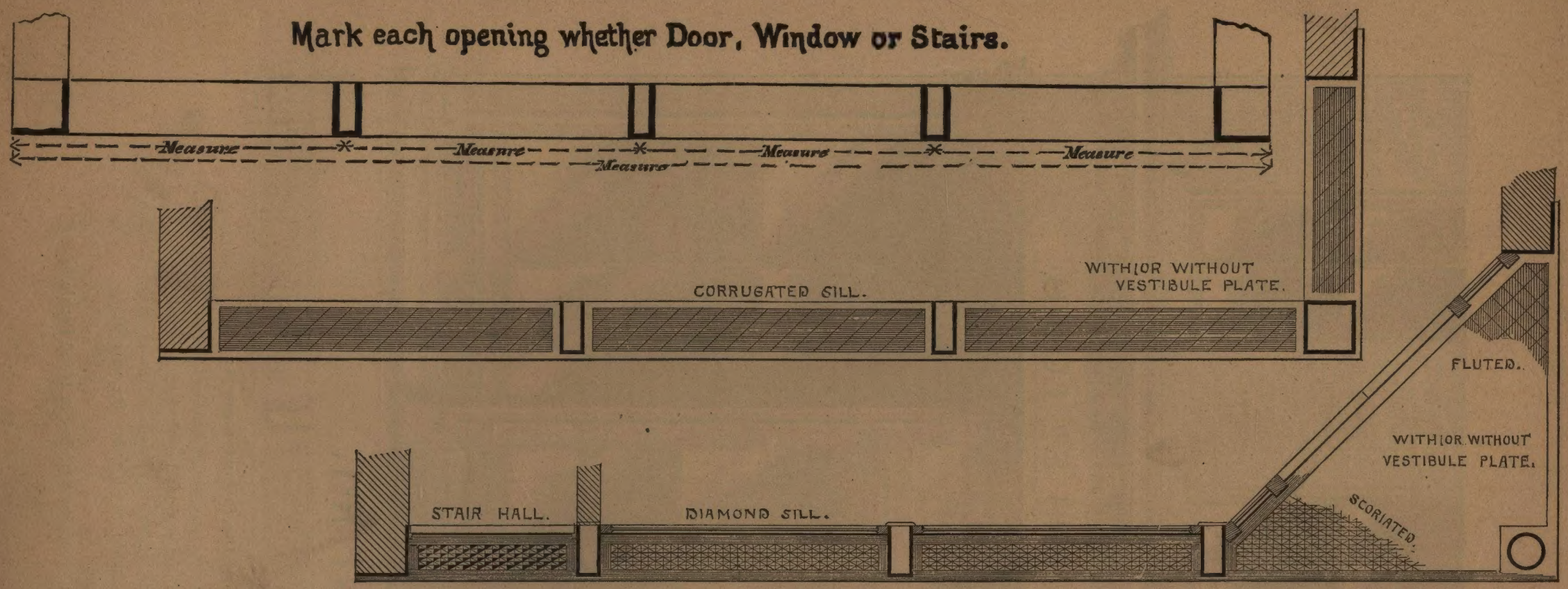
We reiterate our advice to **Order your Iron Work in Time.**

# STORE FRONTS.

DURING the past fifty years, we have probably sent out more of this class of work than any establishment in the West. We make it a specialty, are continually improving in its manufacture, and are now better prepared than ever before to furnish our customers promptly, especially those outside St. Louis, with **First-Class Work,** and in any quantity desired. And here let us say that our establishment is devoted exclusively to the manufacture of **Iron Work for Buildings,** and it needs no argument to show that where manufacturers make a certain class of work a specialty, they certainly ought to excel in workmanship, variety of styles from which to select, and knowledge of general requirements. This advantage we claim for ourselves over other establishments that make all kinds of machinery, etc., and make some house work to fill up.

We need hardly call the attention of parties contemplating building, to the immense advantages **Iron** possesses over stone, brick or wood used for store fronts. Its greatest advantages are lightness, strength and durability. Cast in columns, it can be furnished at a trifling advance over the cost of clumsy stone or brick piers, which exclude the light, and it is more durable and less liable to breakage.

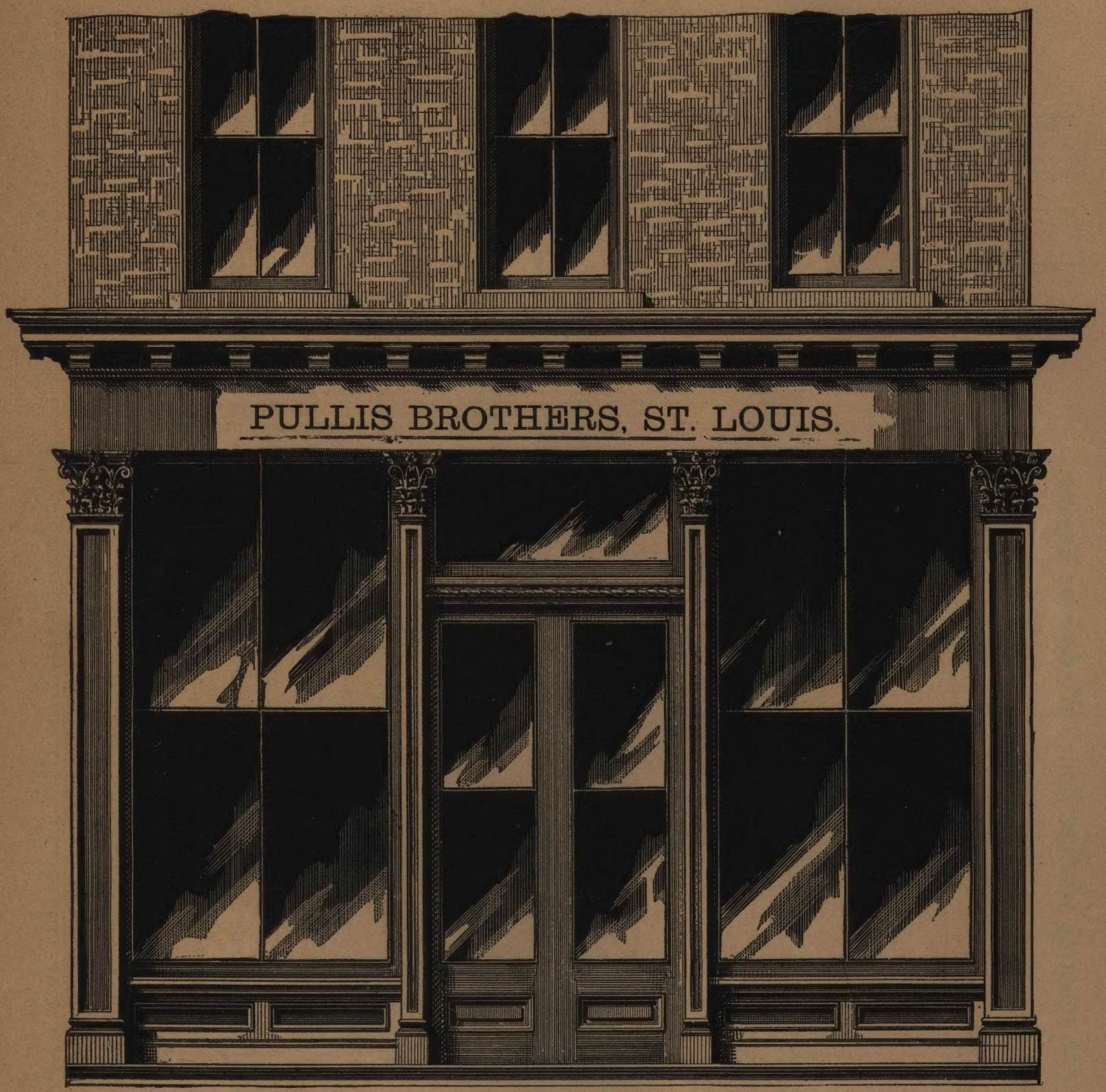
The designs, which we herewith present, are **fac-similes** of fronts that we have actually made and set up in different parts of the country, **patterns** for which we have **on hand,** thereby saving the time and expense of having patterns made to order. Our designs are all drawn, representing a front of twenty-five feet in width, and a thirteen or fourteen foot story, but are, of course, adapted to any width or height of story, with as many openings as desired, arranged for doors or windows, as convenience may dictate. The designs may be varied, however, so that by taking the columns of one front and the lintel and cornice of another, almost an endless variety of styles may be produced. Front No. 12 is constructed with a Cast Iron Arched Tension Girder (shown on page 40, and which can be made, if necessary, thirty feet long), resting on two outside columns, which, together with the Door Sill, is all the iron work about the front. The Girder supports the entire front (six stories high, if necessary), and is cased in with the entablature of wood, iron or other material. The advantages of this manner of construction are, that while it is as cheap, if not cheaper, than columns and lintels, the openings of show windows and doors can be removed at any time, and changes made in same without shoring up the front.




# DIRECTIONS FOR ORDERING STORE FRONTS.

Parties ordering Store Fronts by mail, or seeking information as to cost of same, will save the trouble and time of writing to them for further information, if they will closely observe the following directions: Make a simple sketch of the ground plan of Front, as shown above, showing the position of each of the columns, whether square or round, and mark the distances as indicated. If intermediate columns are round, state whether the doors are to be hung in a line with show windows, or whether they are to be recessed. If party walls are to be used, it would be well to mention it and give particulars. Give all measures and locations as you stand on the **outside** of the building, looking **towards** it. The above is given merely as a guide, as we can make as many or as few openings as desired, but we **must** know how many openings there are to be, for what purpose each is to be used, and the size of each; we must also know the height of the story in the clear between floor and ceiling. Parties should also state whether the projections forming the cap and base of the outside columns are to be returned around side of column, or whether they are to be cut off flush with their own building line.

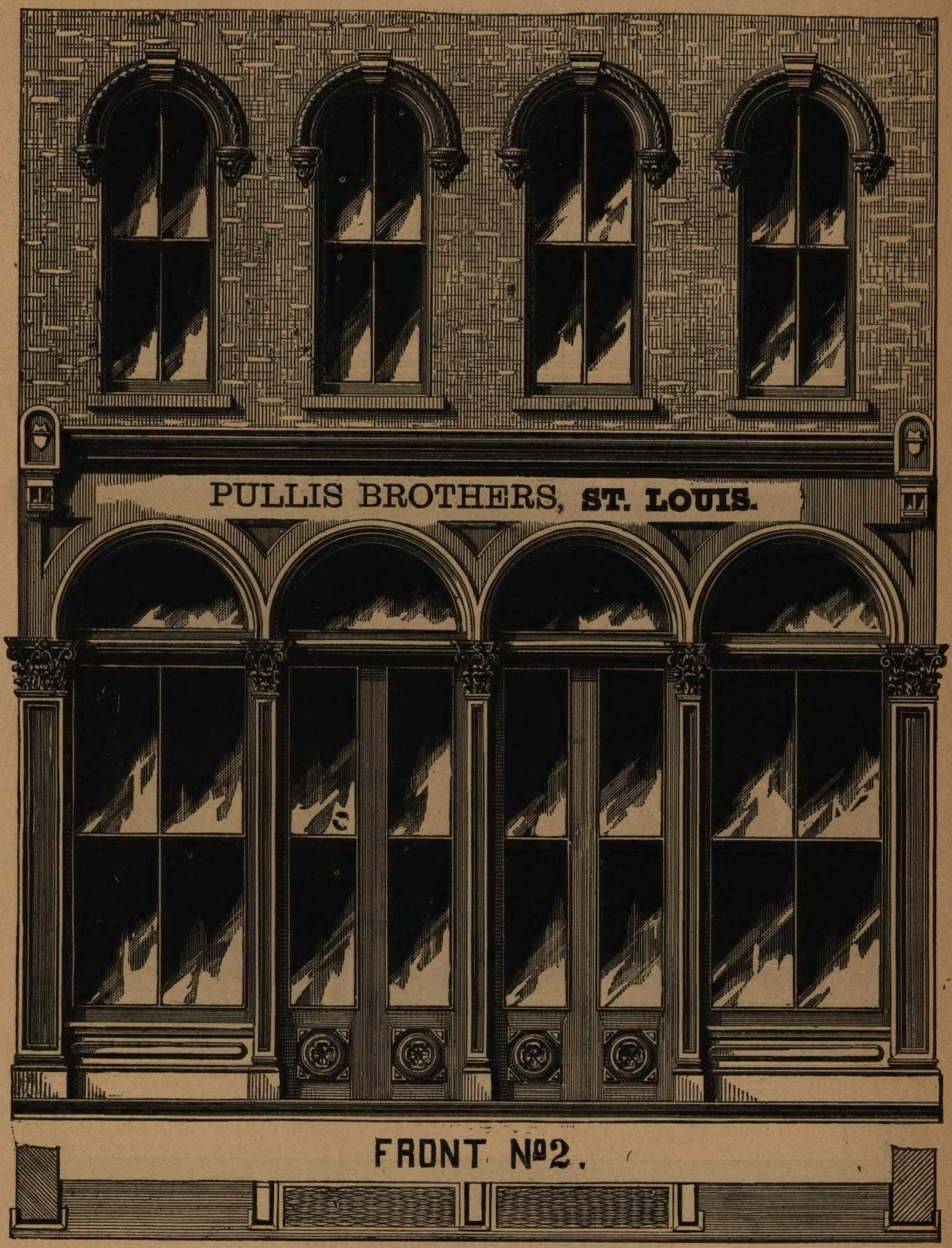
A strict observance of the above directions will enable us to thoroughly understand any order that we may be favored with.




## FRONT No. 1.

**This Front consists of the following parts:**

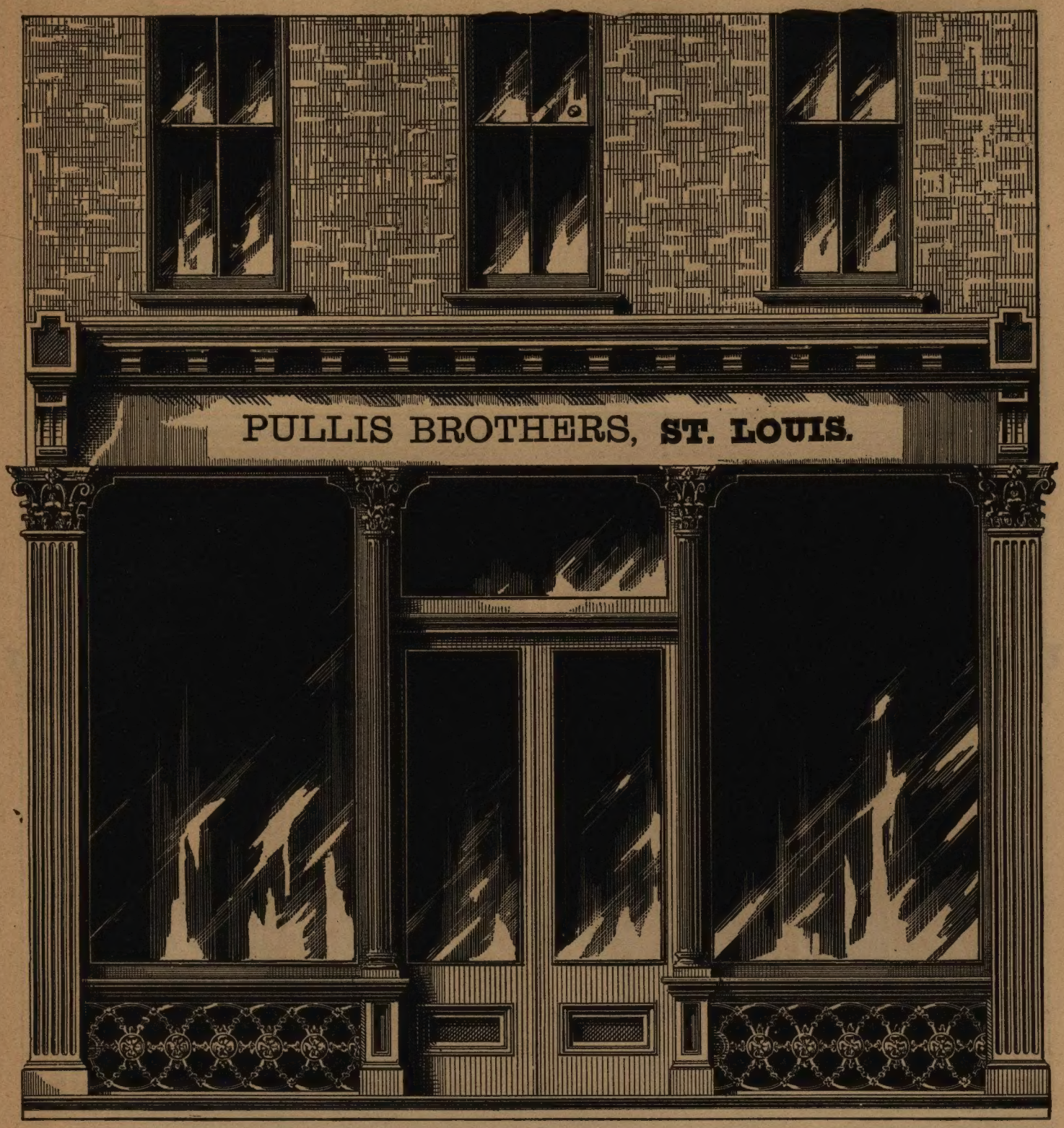
Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Three-Side Columns, 6 inches x 13 inches, any length, face, or depth.
Sill Course, 15 inches wide, with Riser 6 inches, any length, width, or Riser.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Modillion Cornice, as shown, any length.
Cast Iron Guards can be used under show windows in place of Wood Panels.



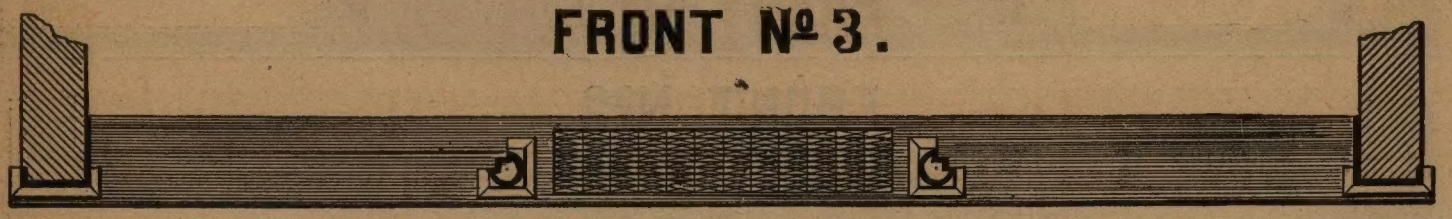

# FRONT №2.

**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Three Intermediate Columns, 6 inches x 13 inches, any length, face, or depth.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Lintel Plate, any length or width.
Molded Cornice, with two Trusses, as shown, any length.
Four Openings of Spandrel and Soffit.
Cast Iron Guards can be used under show windows in place of Wood Panels.




# FRONT No 3.



**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Round Corinthian Columns, 6 inches diameter, with Box Pedestal Base, any length or diameter.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Modillion Cornice, with two Trusses, as shown, any length.
Show Window Guard under windows, any length or height.

# FRONT No. 4.

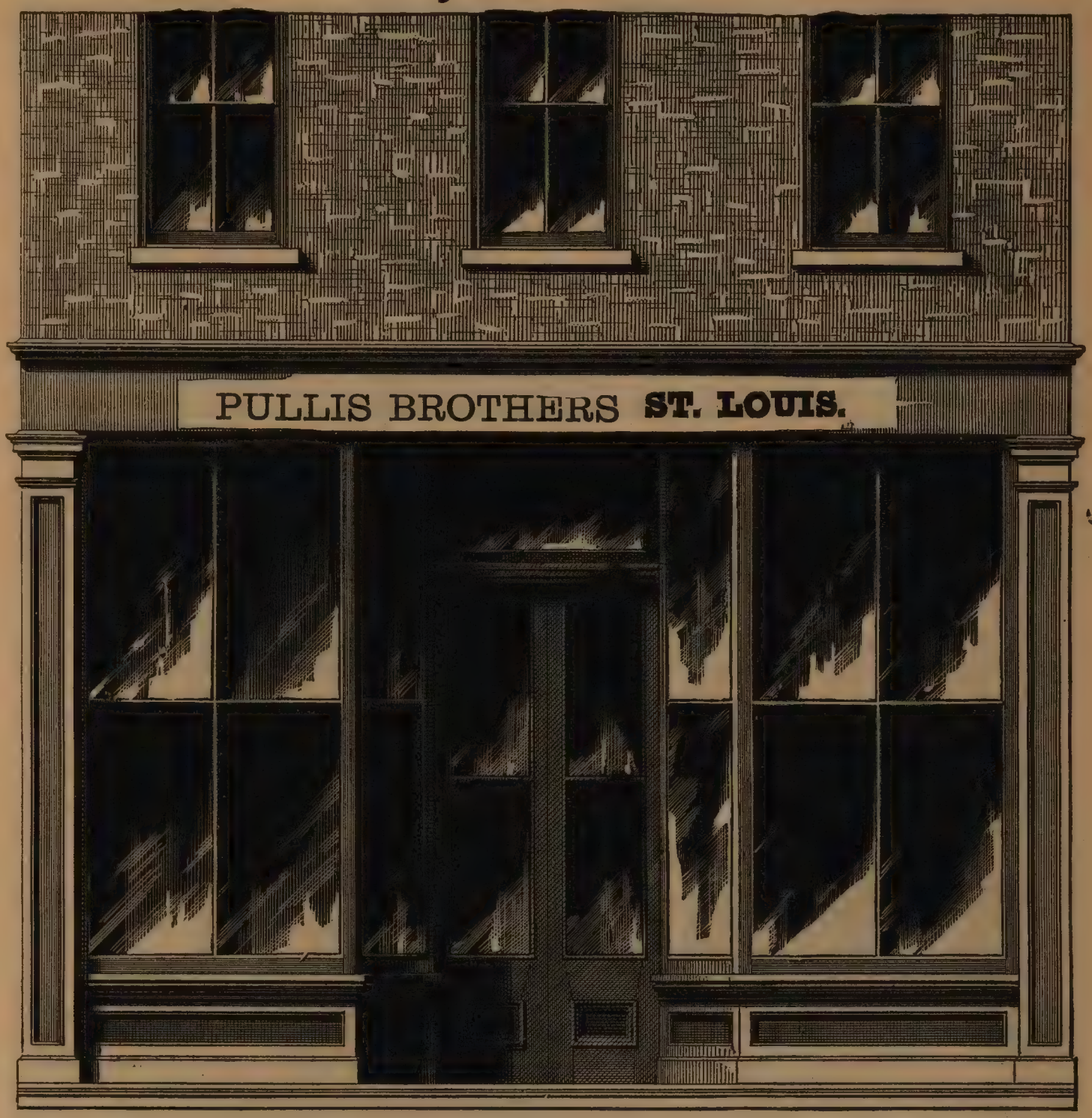
**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Three Intermediate Columns, 6 inches x 13 inches, any length, face, or depth.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Lintel Plate, any length or width.
Modillion Cornice, with two Trusses, as shown, any length.
Four openings of Spandrel and Soffit.
Window Guard under windows, any length or height.

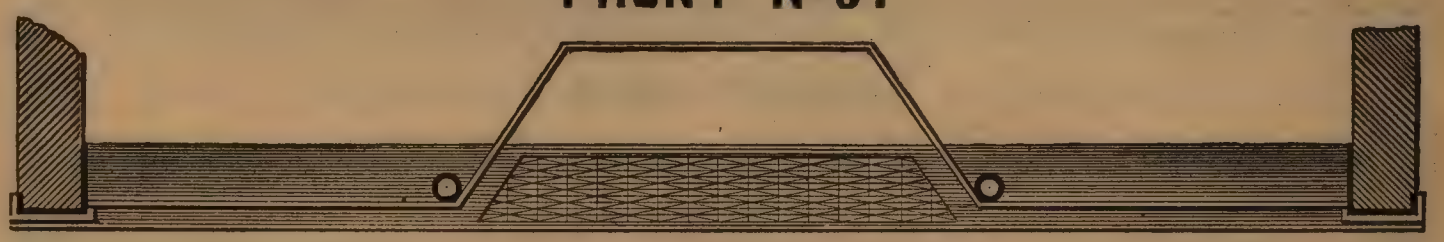
## FRONT No5.

**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Intermediate Columns, 6 inches x 13 inches, any length, face, or depth.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Lintel Plate, any length or width.
Extra Cast or Galvanized Cornice Facia, as shown.
Show Window Guards can be used under windows in place of Wood Panels.

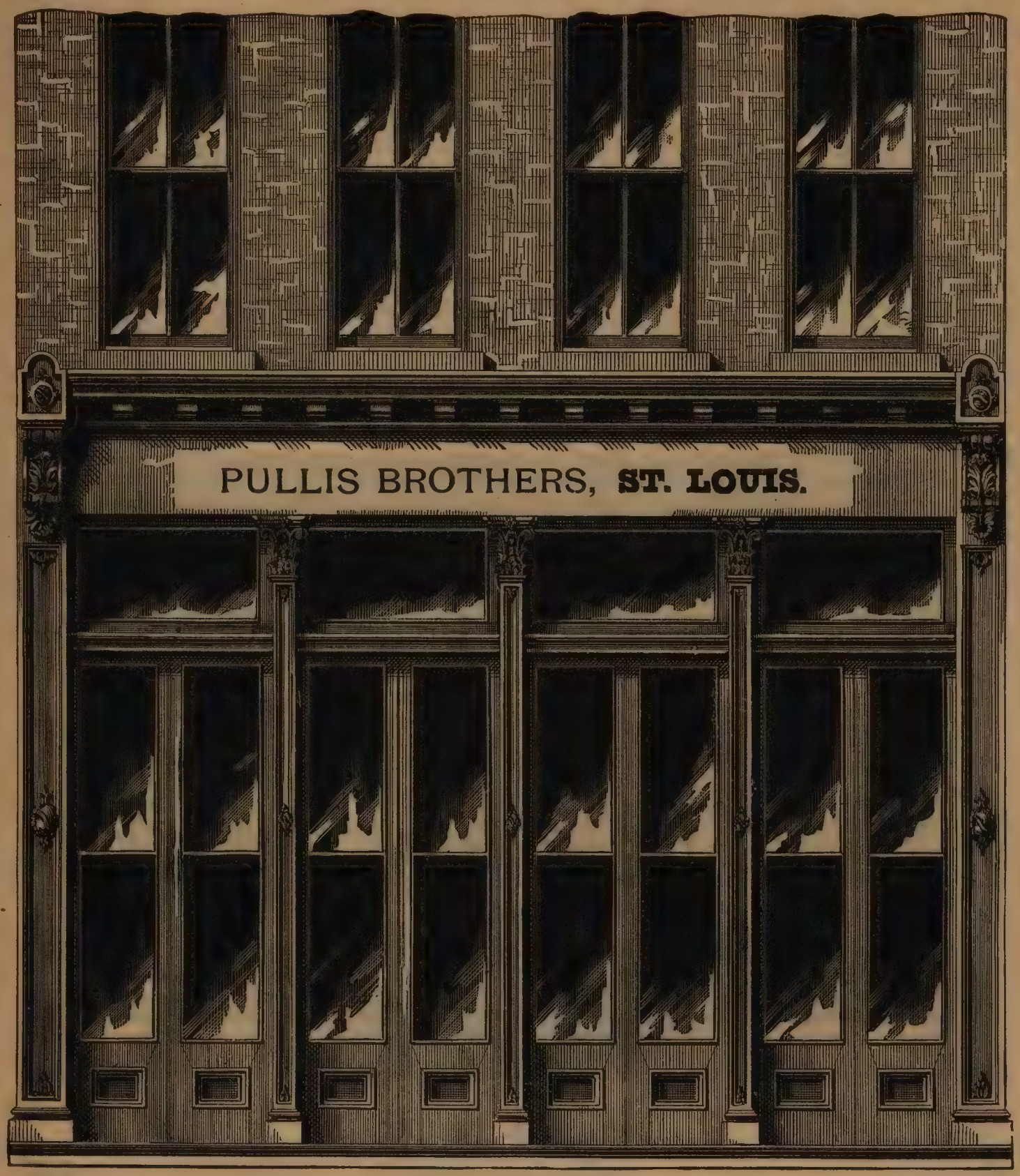



# FRONT Nº6.

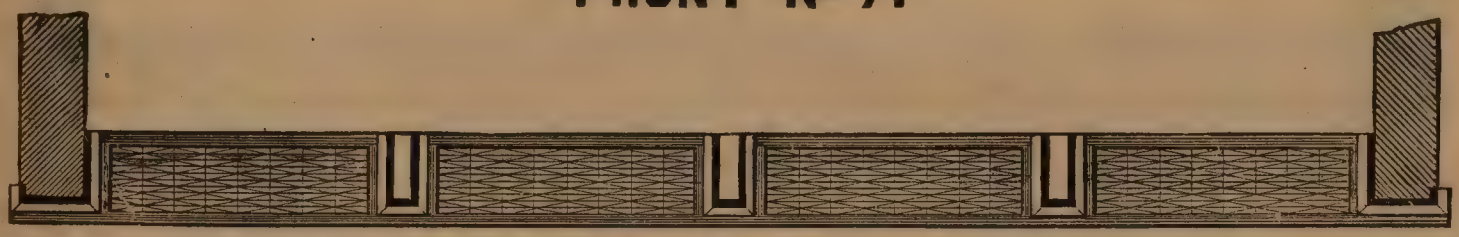


**This Front consists of the following parts:**

Two Angle columns, 13 inches x 13 inches, any length, face, or depth.
Two Plain Round Columns, 5 inches diameter, any length or diameter.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Lintel Plate, any length or width.
Extra Cast or Galvanized Cornice and Facia, as shown.
Cast Iron Guards can be used under windows in place of Wood Panels.




# FRONT No 7.



**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Three Intermediate Columns, 6 inches x 13 inches, any length, face, or depth.
Box Girder, 18 inches by 13 inches, any length. See page 40.
Modillion Cornice, with two Trusses, as shown, any length.

# FRONT No 8.

**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Intermediate Columns, 6 inches x 13 inches, any length, face, or depth.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Modillion Cornice, with two Trusses, as shown, any length.
Also, Cast Iron Guards under show windows in place of Wood Panels, if required.

## FRONT No. 9.

**This Front consists of the following parts:**

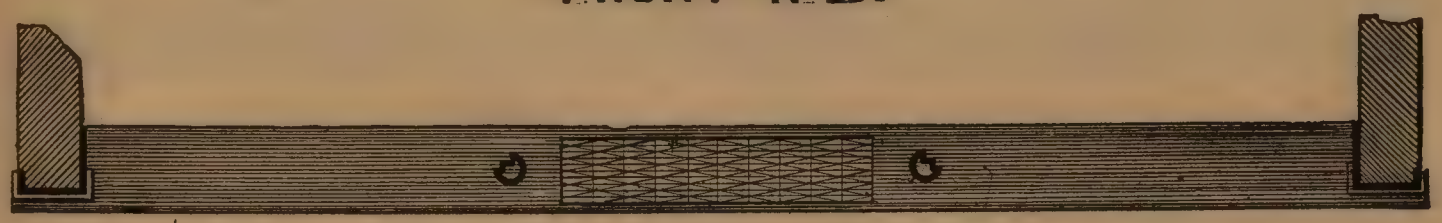
Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Rope Columns, 6 inches diameter, with Box Pedestal Bases, or any diameter.
Two Half Rope Columns, 6 inches diameter, with Box Pedestal Bases, or any diameter.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Fancy Cornice, with two Trusses, any length.
Three openings of Spandrel and Soffit.
Die Course, including Base, Guards, and Rail, under show windows, all iron, any length or height.

# FRONT No. 10.

**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Square Intermediate Columns, 6 inches x 6 inches, with Box Pedestal Bases, any size.
Two Half Columns, 3 inches x 6 inches, with Box Pedestal Bases, any size.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Modillion Cornice, with two Trusses, as shown, any length.
Three openings of Spandrel and Soffit.

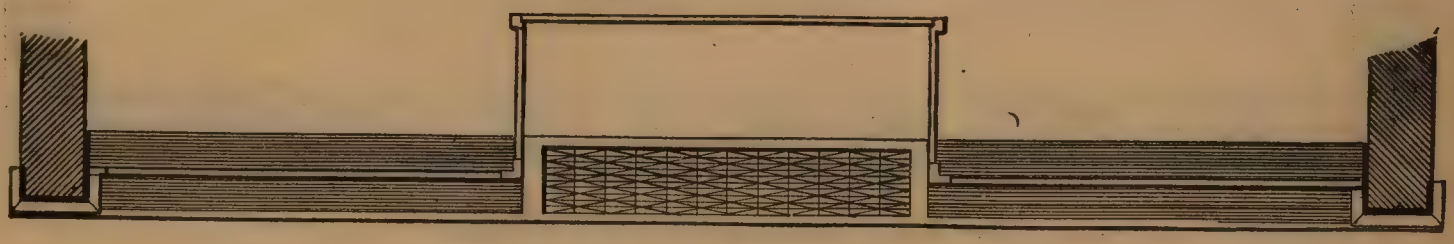
## FRONT No11.



**This Front consists of the following parts:**

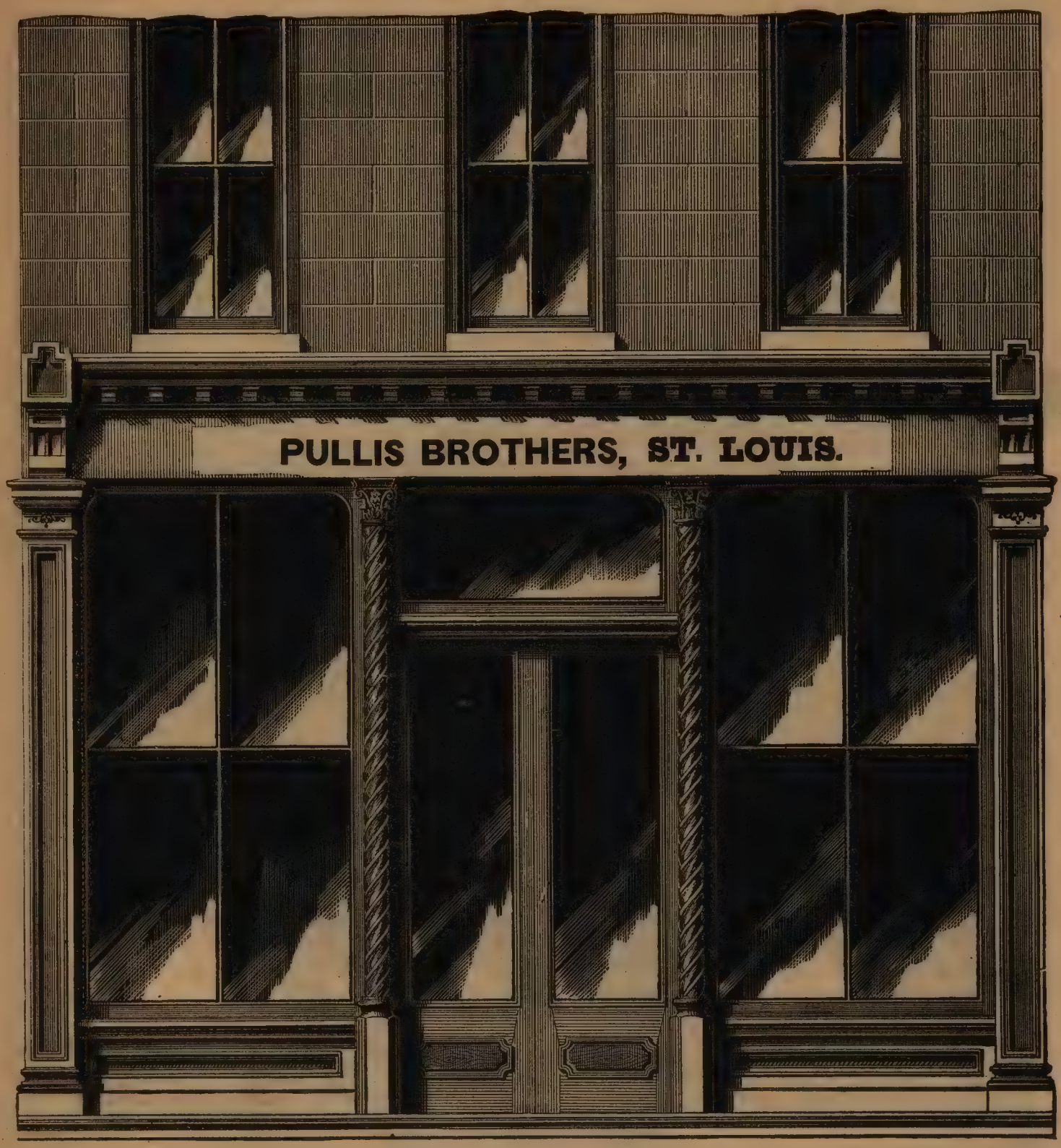
Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Grecian Fluted Columns, 4, 5, or 6 inches in diameter, or any diameter, with Pedestal Base.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Cornice, with two Trusses, as shown, any length.
Or, leave off Girder and Cornice and use only Lintel Plate.

# FRONT №12.



**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Tension Rod Girder, any length up to 30 feet, or width of wall. See page 40.
Extra Cast or Galvanized Cornice, as shown.




# FRONT №13.

**This Front consists of the following parts.**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Rope Columns, 6 inches diameter, any length or any diameter.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Modillion Cornice, with two Trusses, as shown, any length.
Cast Iron Guards can be used under show windows in place of Wood Panels.

# FRONT No14.

**This Front consists of the following parts:**

Two Angle Columns, 13 inches x 13 inches, any length, face, or depth.
Two Round Intermediate Columns, 6 inches diameter, with Box Pedestal Bases, or any diameter.
Sill Course, 15 inches wide, with 6 inch Riser, any length, width, or Riser.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Cornice, as shown, any length.
Three openings of Spandrel and Soffit.
Window Guard, under show windows, any length or height.

FRONT No. 16.

Schedule and Detail of Work as called for.

FRONT Nº 18.

PULLIS BROTHERS, ST. LOUIS.

FRONT No. 19.

Schedule and Detail of Work as called for.

FRONT Nº 20

**This Front consists of the following parts:**

Two Pilasters, 15 inches face, any length, face, or depth.
Two Intermediate Columns, 8 inches x 10 inches, any length, face, or depth.
Two Half Columns, 8 inches x 10 inches, any length, face, or depth.
Sill Course, 15 inches wide, 6 inch Riser, any length, width, or Riser.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Modillion Cornice, as shown, any length.
Two Trusses.
Three openings of Spandrel and Soffit.
Die Course, under show windows, any size or design. See page 64.

FRONT. Nº 21.

**This Front consists of the following parts:**

Two Pilasters, 15 inches face, any length, face, or depth.
Two Intermediate Columns, 8 inches diameter, any length, face, or depth.
Two Half Columns, 8 inches diameter, any length, face, or depth.
Sill Course, as shown, with Recessed Vestibule Door Plate, 3 feet wide, or any width.
Box Girder, 18 inches x 13 inches x 6 inches, any length. See page 40.
Cornice, as shown.
Two Trusses.
Three openings of Spandrel and Soffit.
Die Course, under show windows.

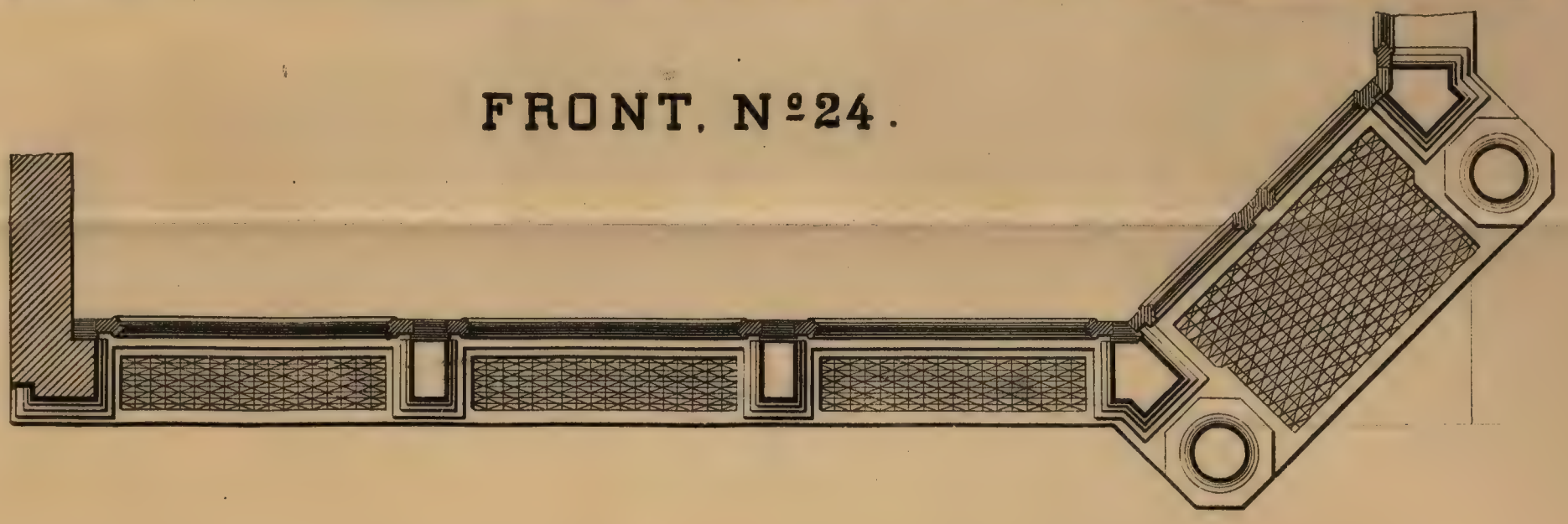
FRONT No. 22.

PULLIS BROS. ST. LOUIS.

**FRONT № 23.**

Schedule and Detail of Work as called for.

FRONT. Nº24.



Schedule and Detail of Work as called for.

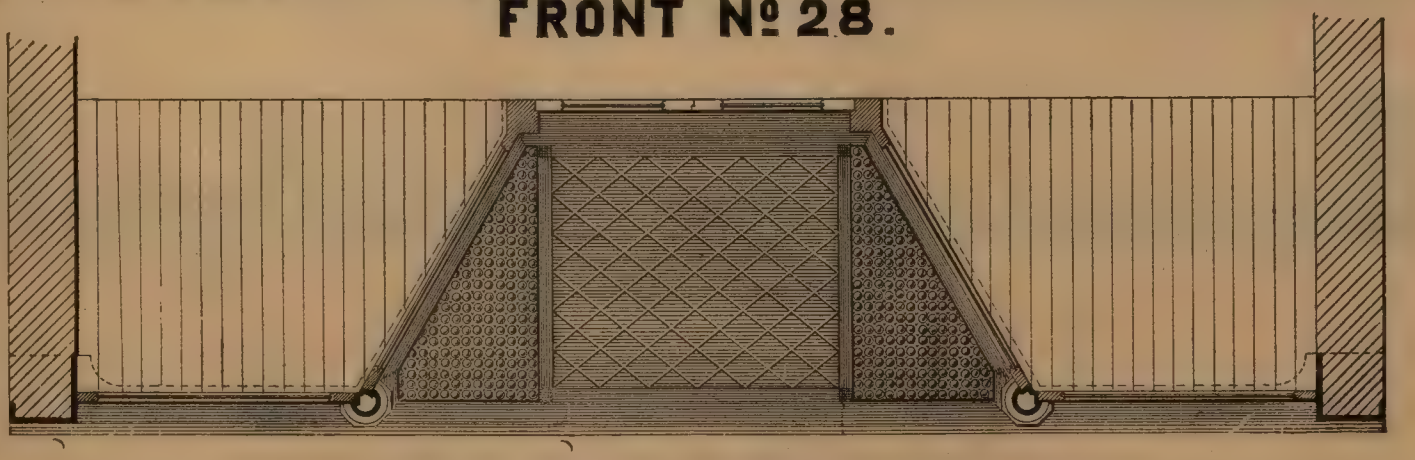
**№25.**

# FRONT No. 26.

**This Front consists of the following parts:**

Two Box, Angle, or Pilaster Columns, any face, height, or depth.
Three Intermediate Columns, 7 inches face x 13 inches, any height, face, or depth,
Sill Course, 15 inches x 6 inch Riser.
Lintel Course, 13 inch bed.
Galvanized Cornice and Truss Blocks (all galvanized work furnished by us).
Openings Show Guard, any size or design. See page 64.

## FRONT No. 28.

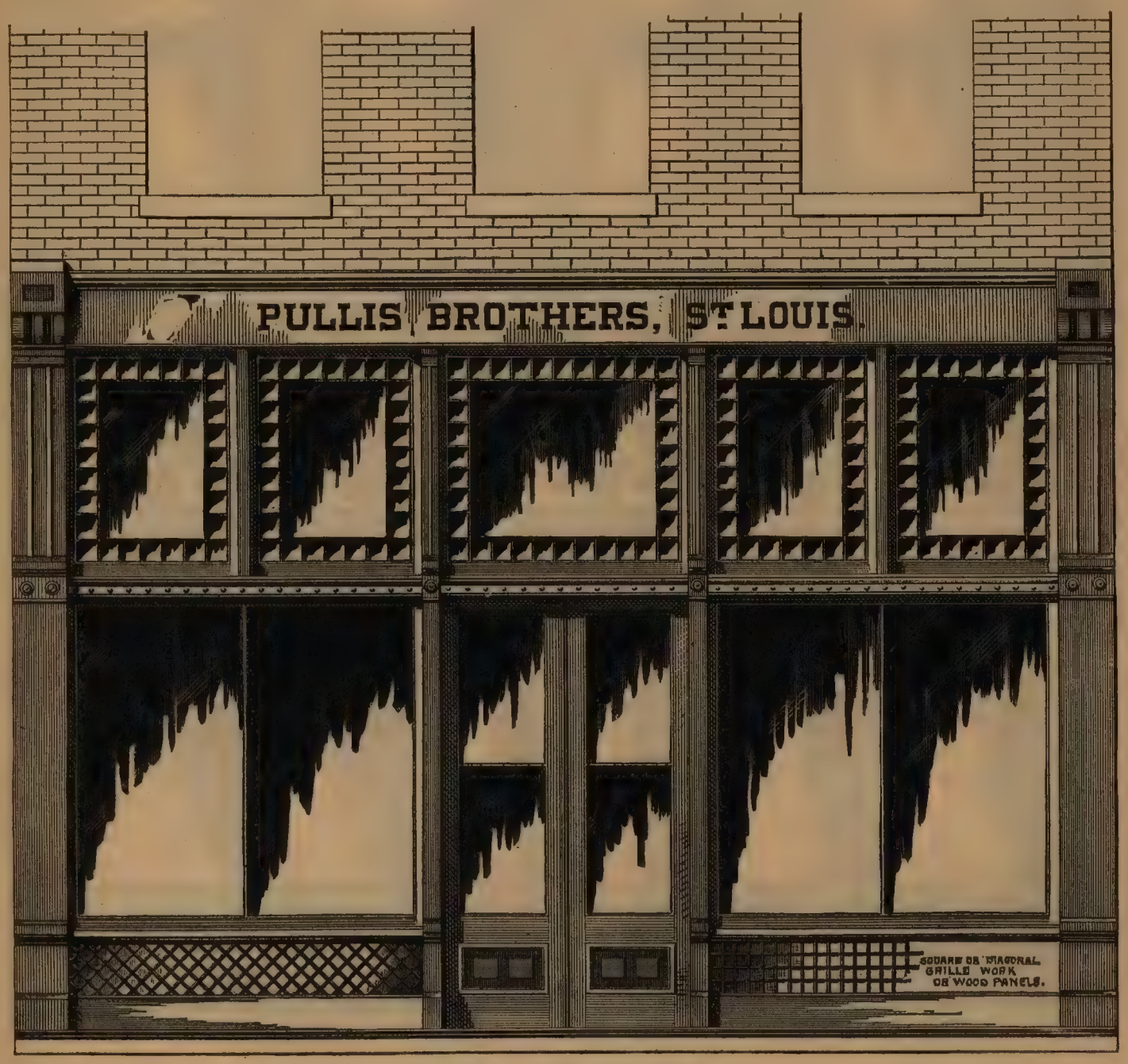


**This Front consists of the following parts:**

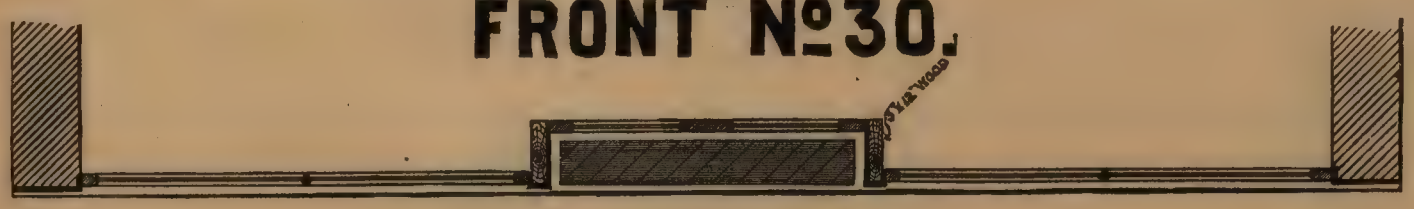
Two Angle Columns, any face, height, or depth.
Two Round Rabbeted Columns, any diameter or height.
Sill Course, 15 inches x 6 inch Riser, or any width or Riser.
Vestibule Plate, any size or depth, with or without Tiling.
Girder of two Eye Beams, any size or length.
Two End Blocks.
Also, Show Guard, any size or design.

**FRONT No. 27.**

Schedule and Detail of Work as called for.

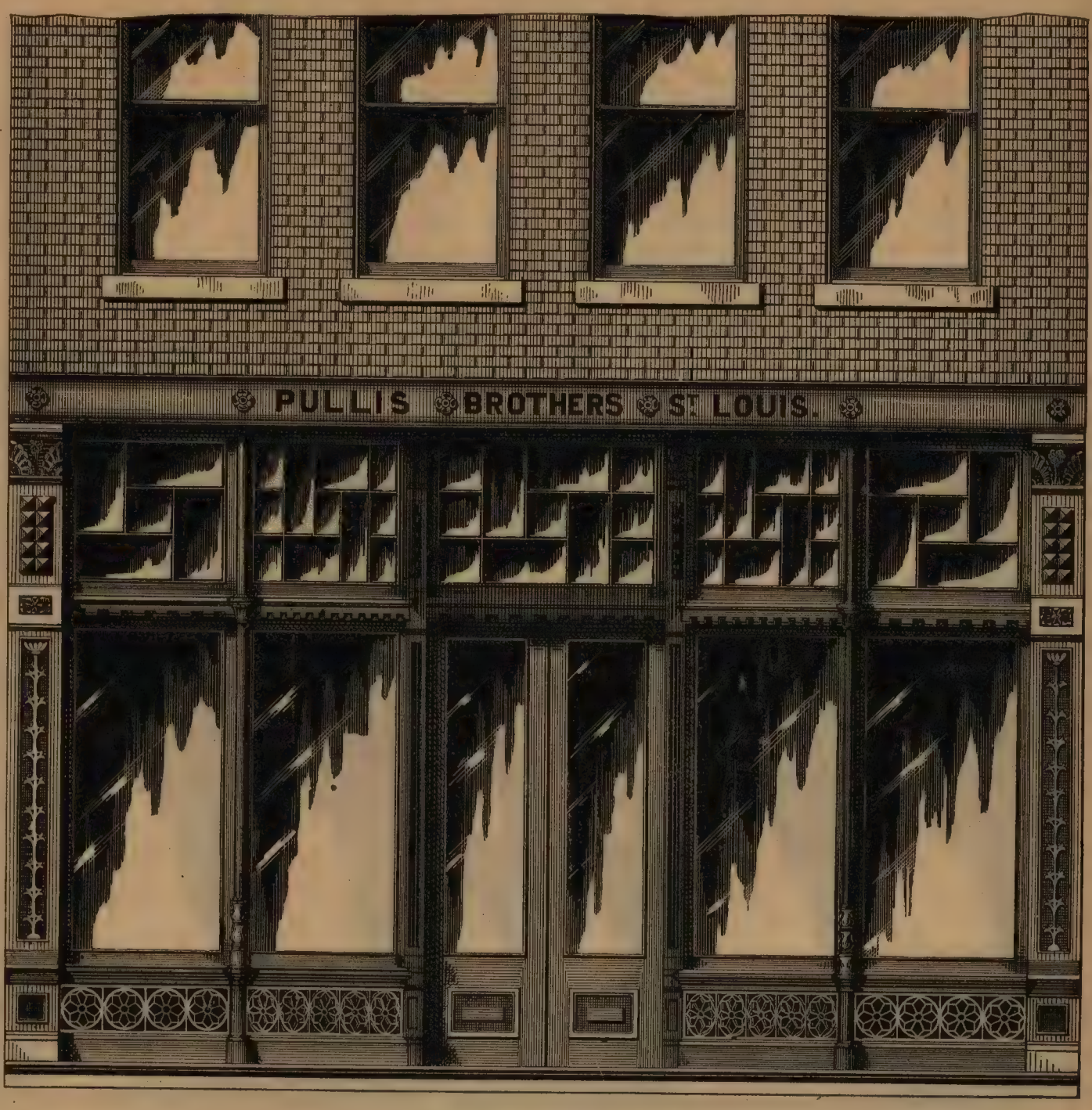



# FRONT No. 30.

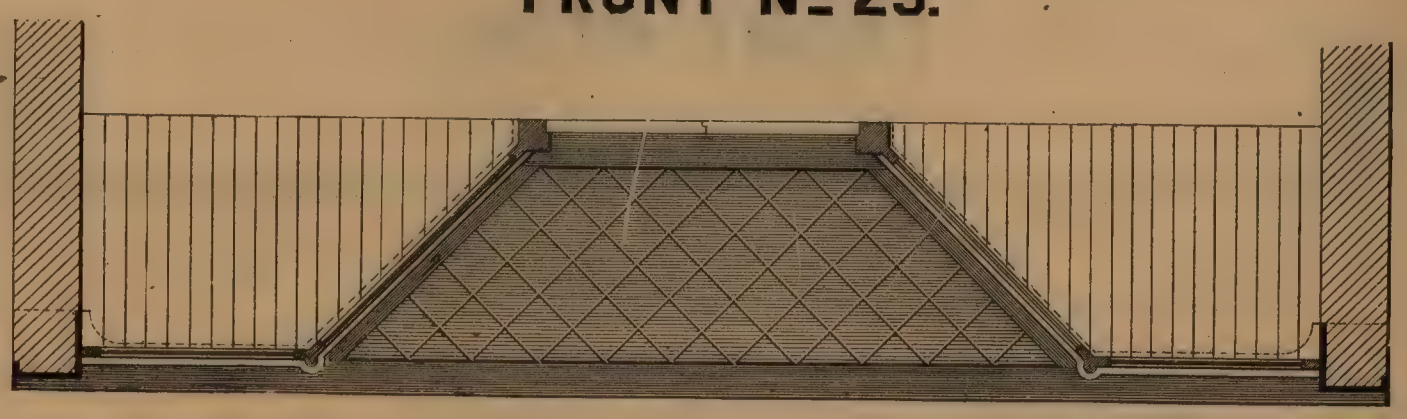



**This Front consists of the following parts:**

Two Pilasters, 13 inches face x 4 inch Return, any height.
Two Angle Columns, 4 inches face x 4 inches x 13 inches Return, any height.
Door Sill, 15 inches x 6 inch Riser, or any width or Riser.
Show Window Sills, 6 inches x 6 inch Riser, or any width or Riser.
Lintel Course, 13 inch wall.
Molded, Cast, or Galvanized Cornice, as shown.
Two Truss Blocks.
Grills, or Show Window Guards, as shown, or other styles.

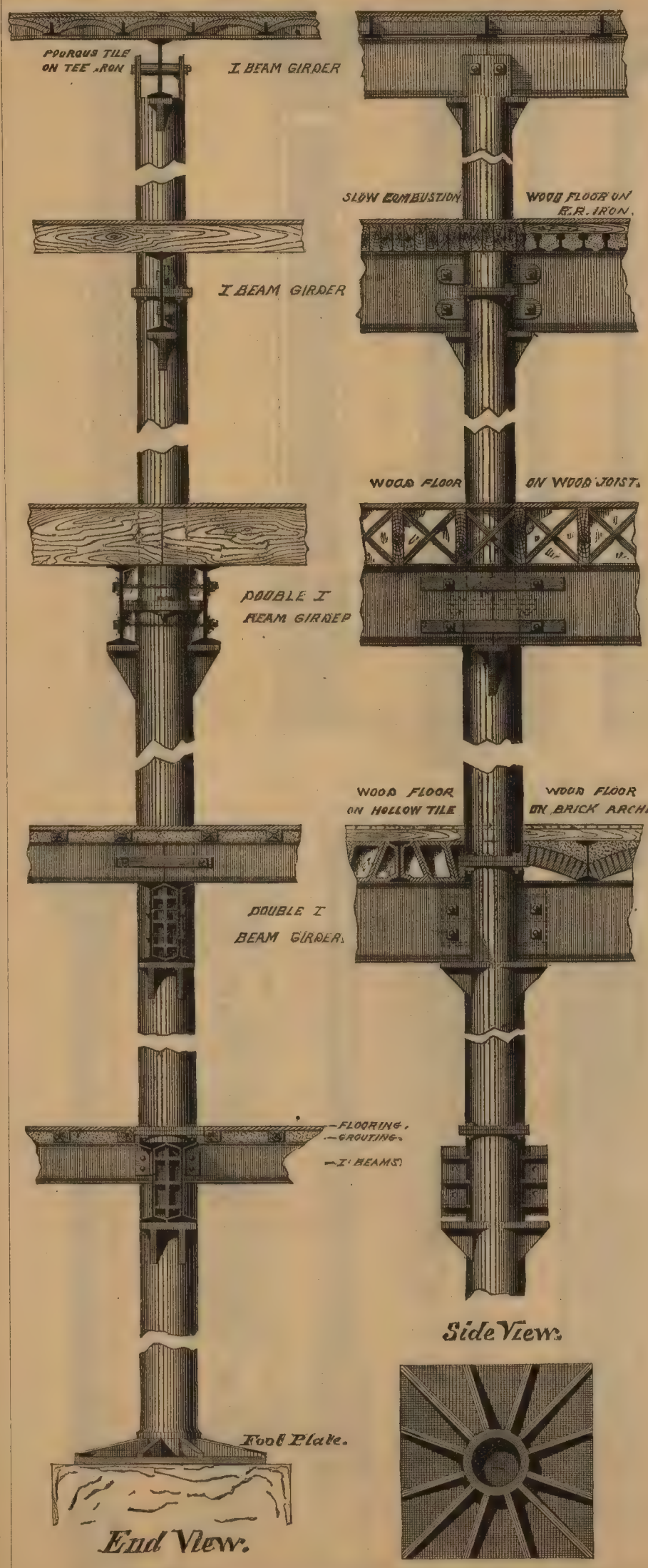


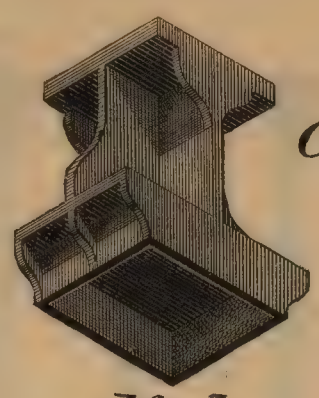

# FRONT No 29.



**This Front consists of the following parts:**

Two Angle Columns, any face, height, or depth.
Sill Course, 15 inches x 6 inch Riser, or any width or Riser.
Vestibule Plate, any size.
Girder of two Eye Beams, any size or length.
Four Openings Show Guards, any style. See page 64.

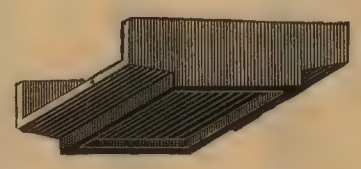


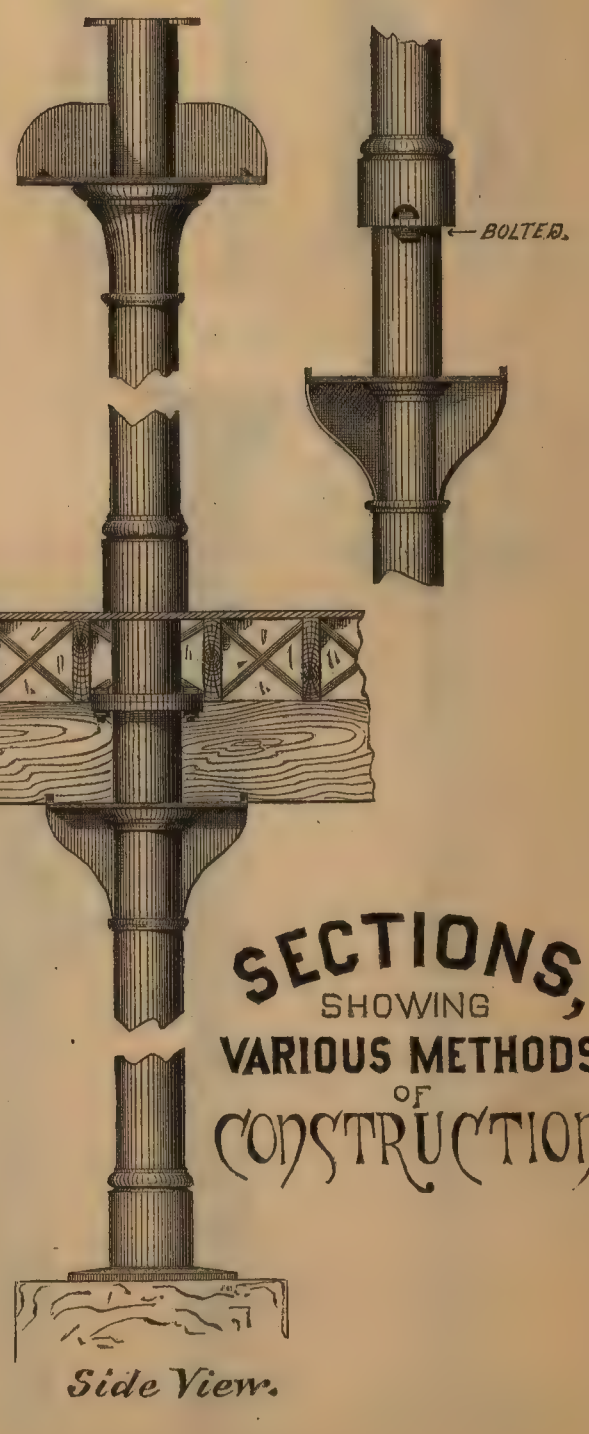
## Cast Iron Dowels.

*Made to any size and shape required*

No. 1.



No. 2.



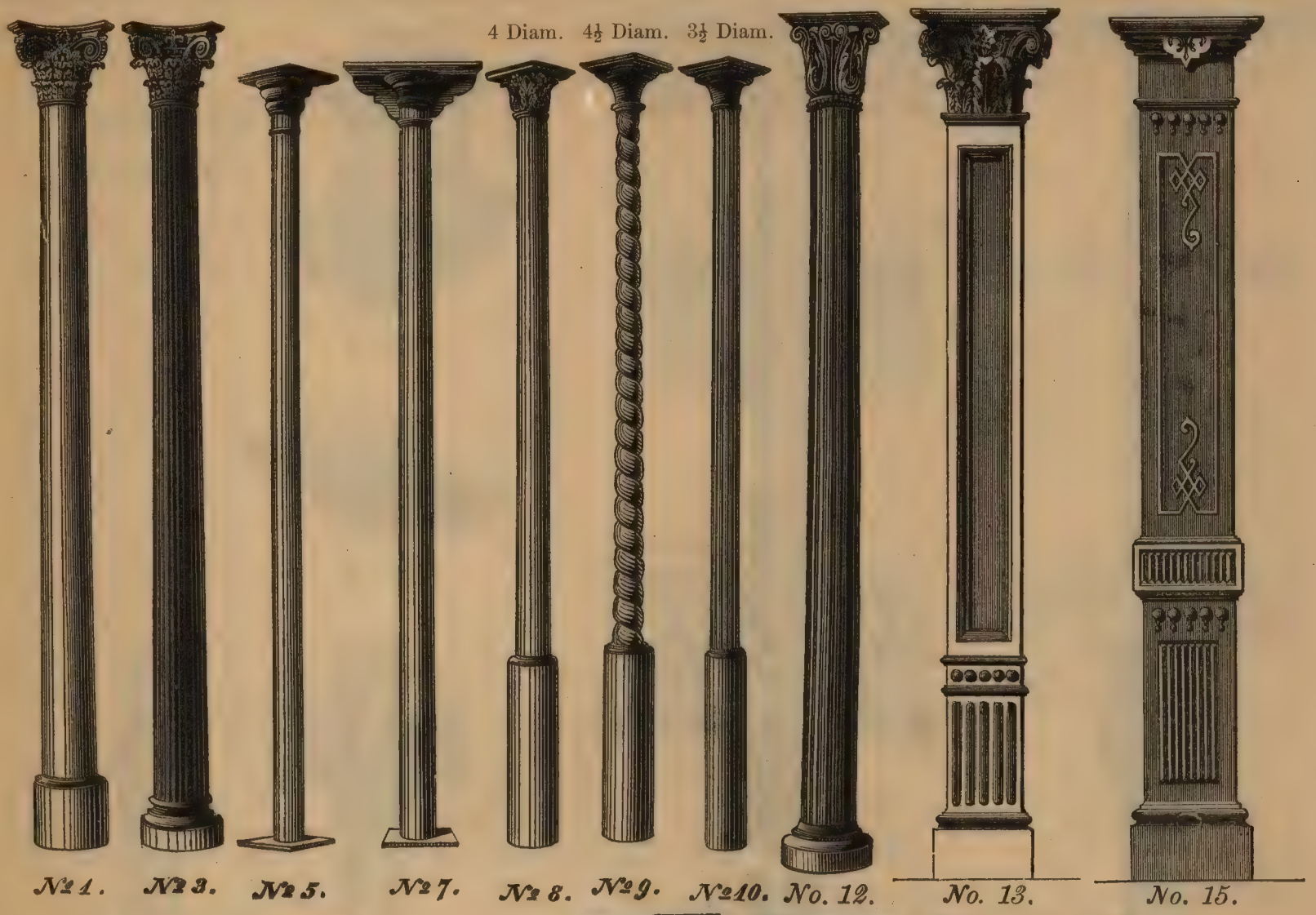

## SECTIONS, SHOWING VARIOUS METHODS OF CONSTRUCTION.

Side View.

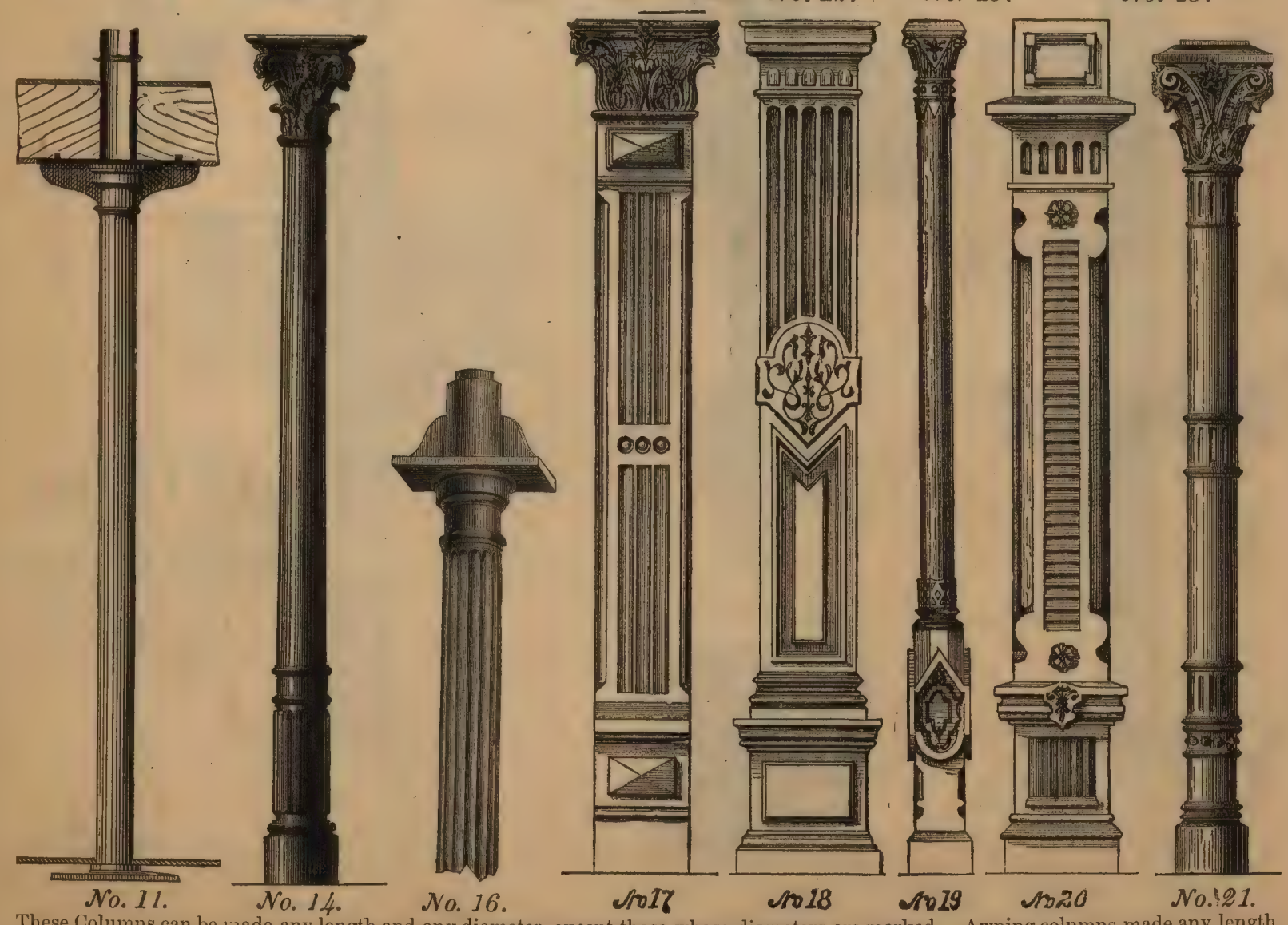
Structural Work, in heavy cast and wrought iron, of all descriptions.

☞ Send for Estimates.

4 Diam. 4½ Diam. 3½ Diam.

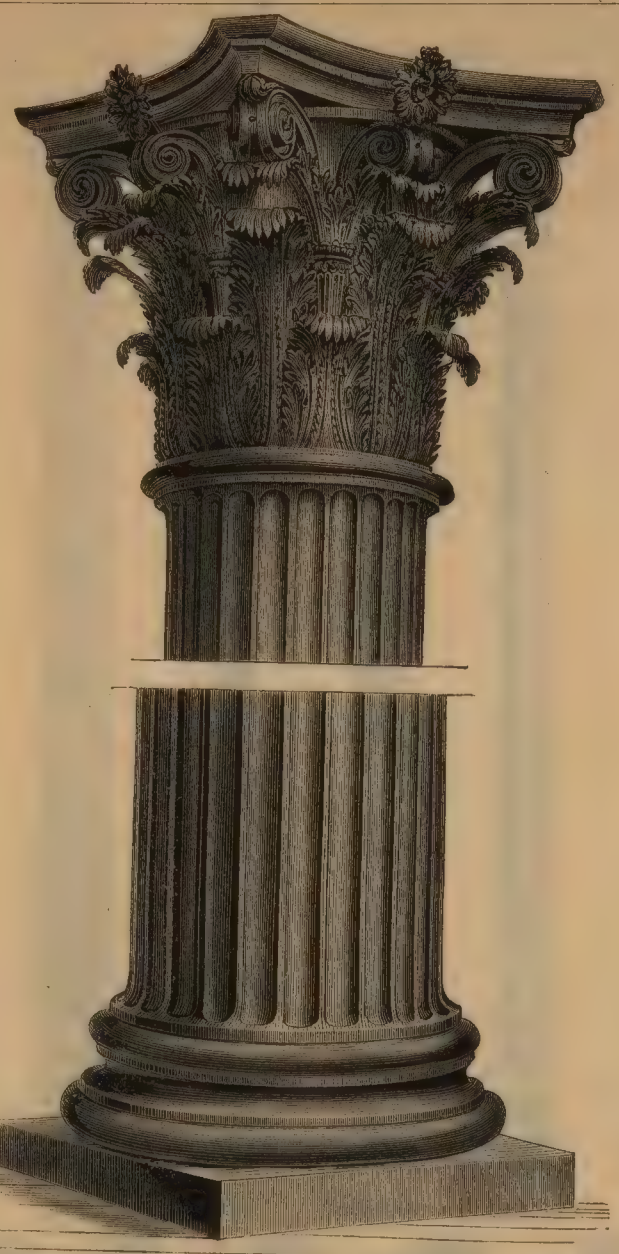


№ 1. № 3. № 5. № 7. № 8. № 9. № 10. No. 12. No. 13. No. 15.

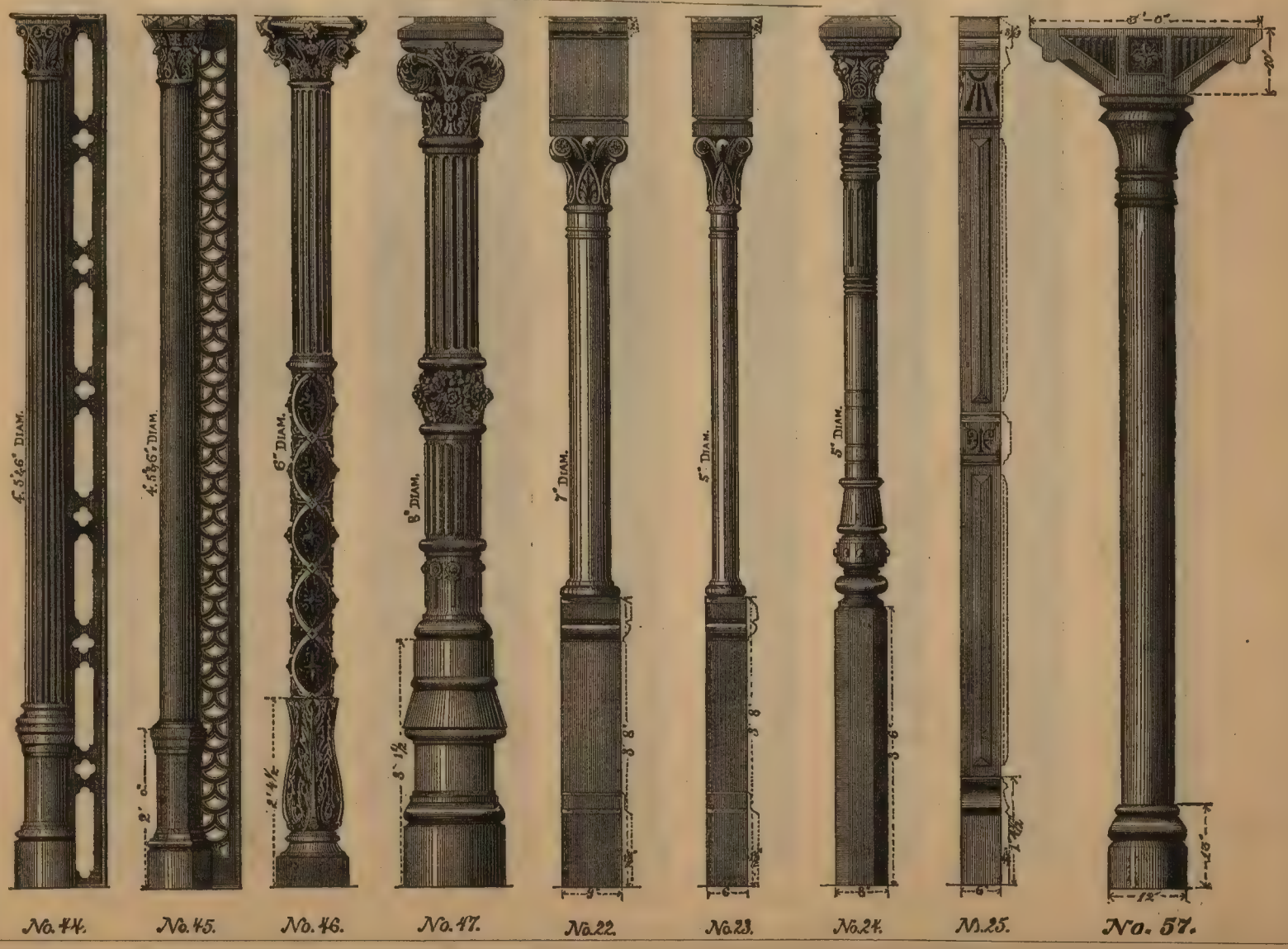


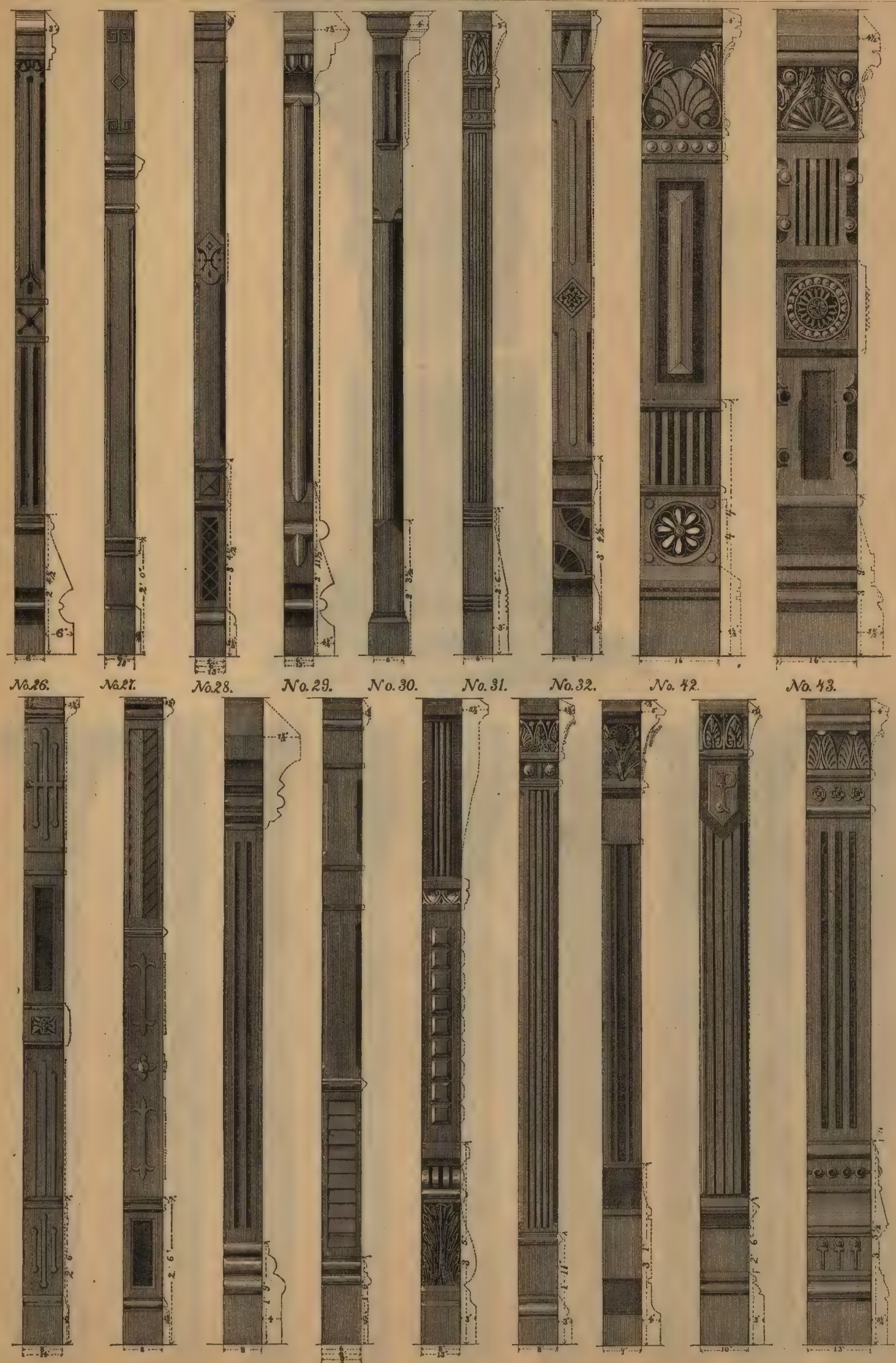
No. 11. No. 14. No. 16. № 17 № 18 № 19 № 20 No. 21.

These Columns can be made any length and any diameter, except those whose diameters are marked. Awning columns made any length.



These Columns can be made any length and any diameter. Awning Columns made any length.





No. 26. No. 27. No. 28. No. 29. No. 30. No. 31. No. 32. No. 42. No. 43.



No. 33. No. 34. No. 35. No. 36. No. 37. No. 38. No. 39. No. 40. No. 41.

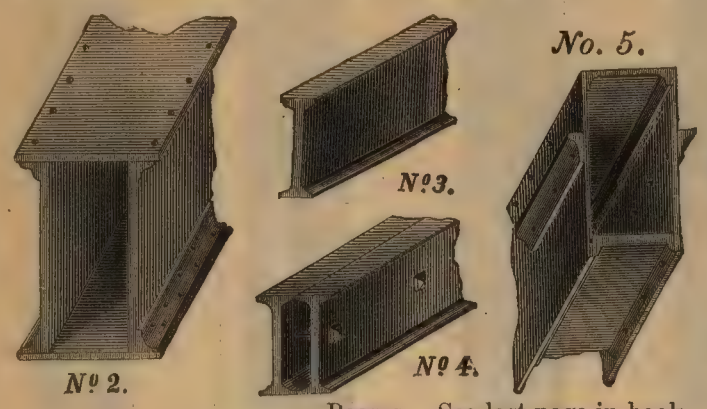
These Columns can be made any length, width or depth. Awning columns made any length.

No. 48. No. 49. No. 50. No. 51. No. 52. No. 53. No. 54. No. 55 No. 56.

No. 81. No. 82. No 83. No 84. No 85. No 105. No 107. No 113. No. 115.

These Columns can be made any size required.

# GIRDERS.

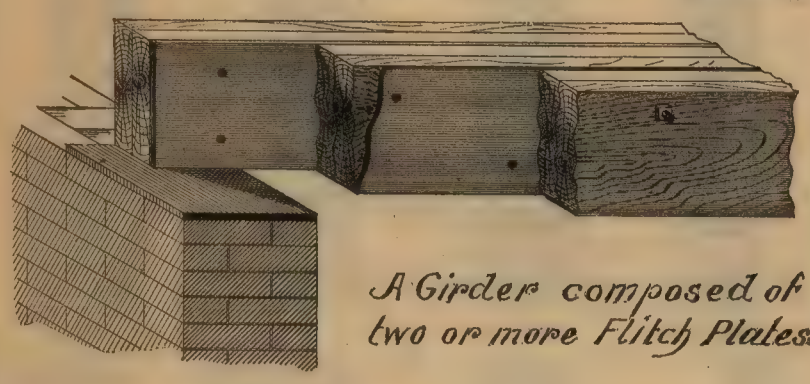



Beams. See last page in book.

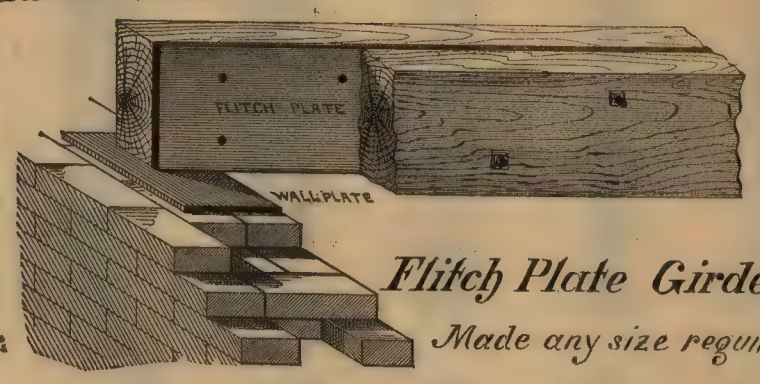
Lattice Girders, light or heavy.

See Front No. 12.

*Arched Tension Girder.*

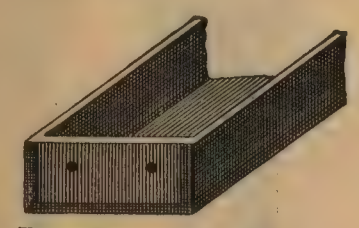


*A Girder composed of two or more Flitch Plates.*

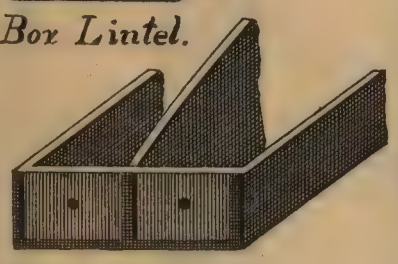



*Flitch Plate Girders.*

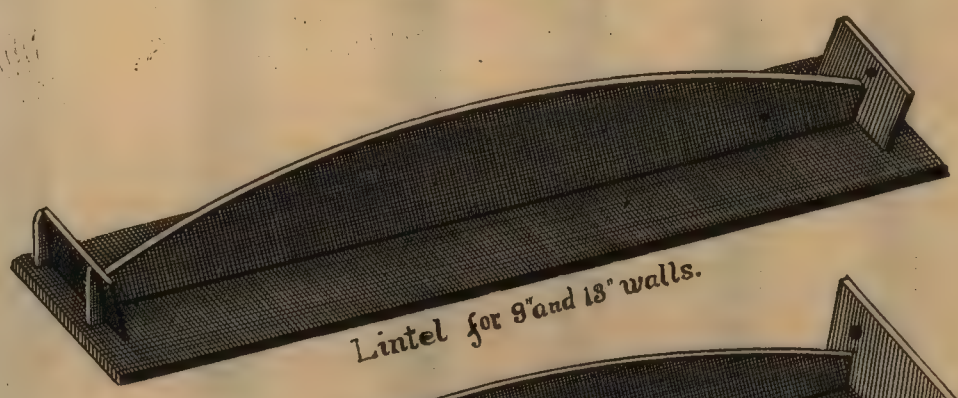
*Made any size required*



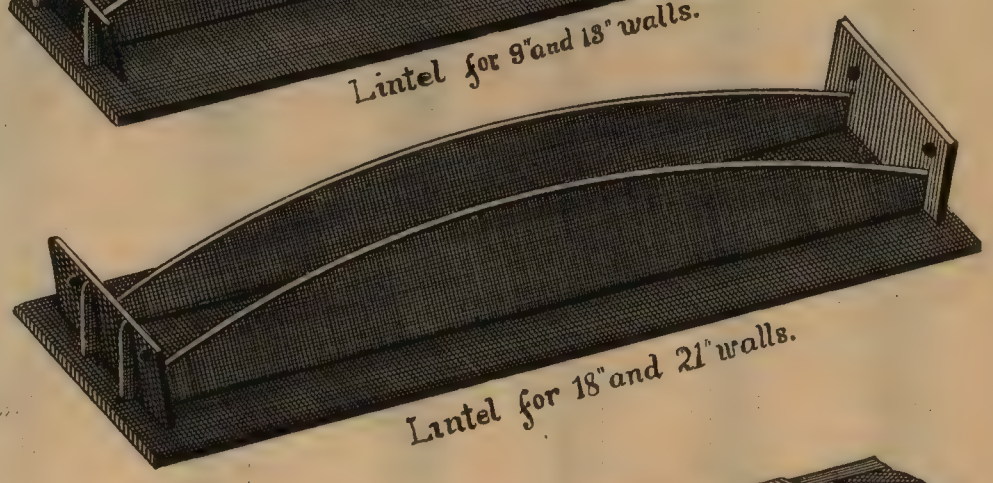
*Box Lintel.*



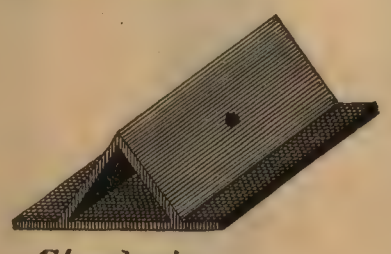
*Box Lintel.*



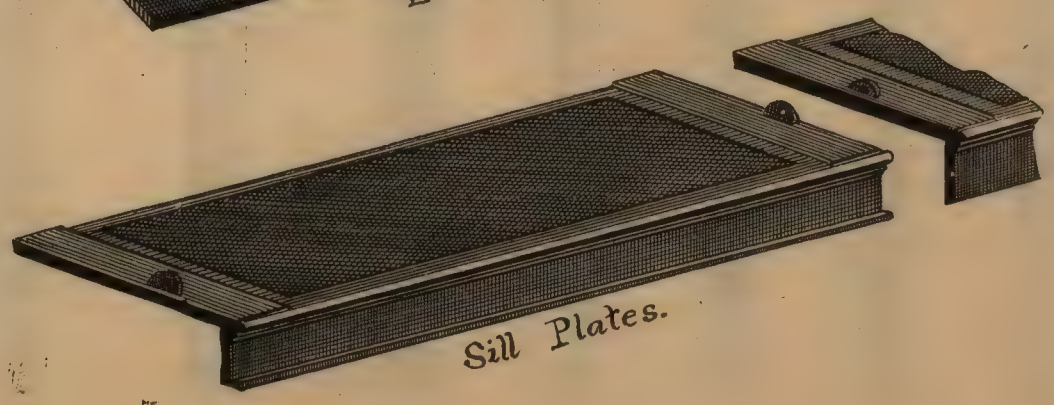
Lintel for 9" and 13" walls.



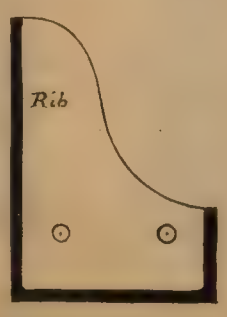
Lintel for 18" and 21" walls.



*Skewback.*



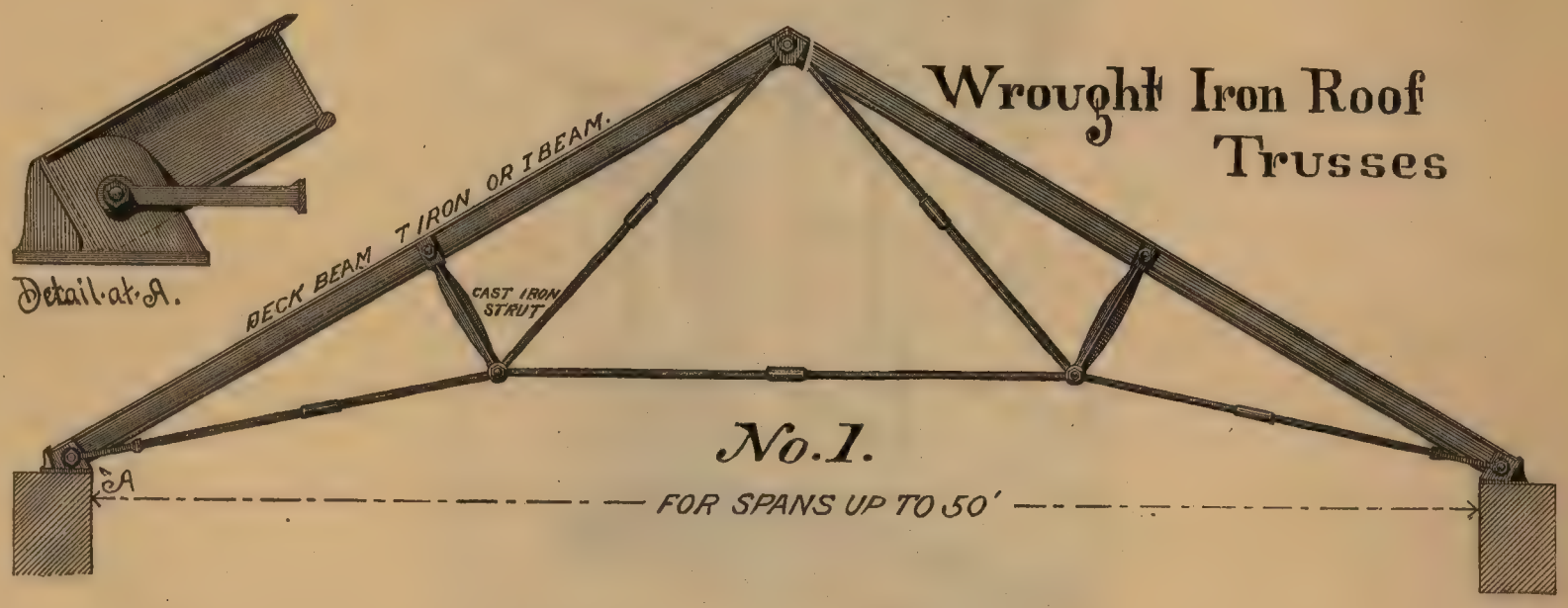
Sill Plates.



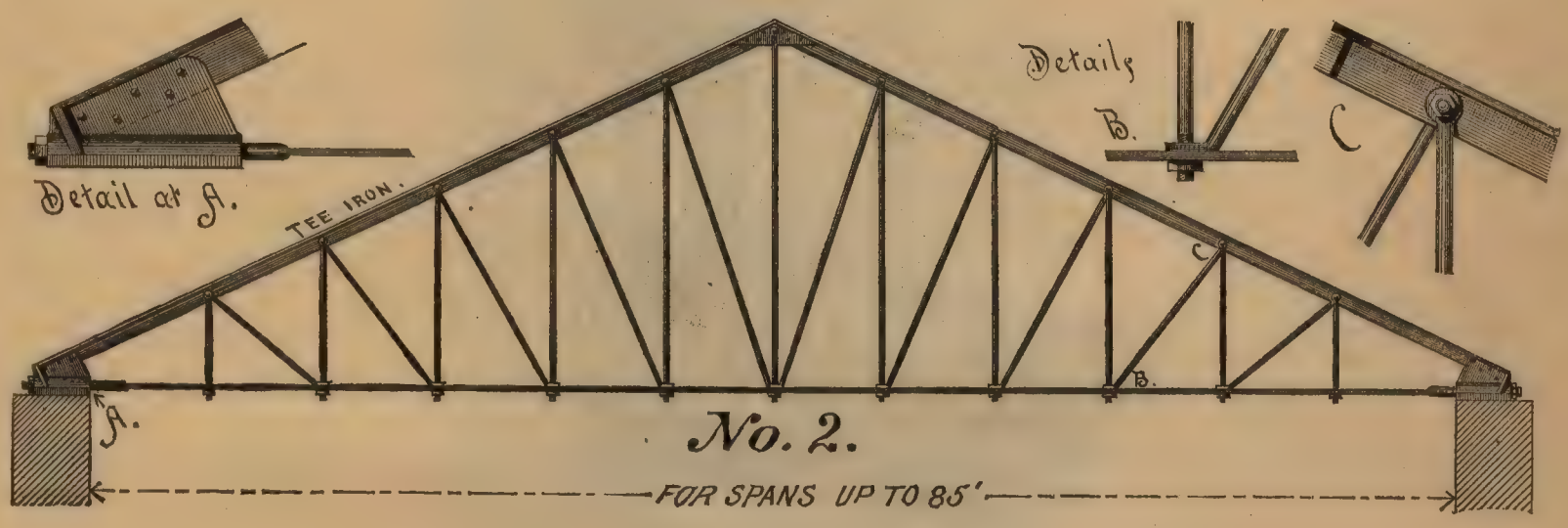

*Box Girder.*

# ROOF TRUSSES.

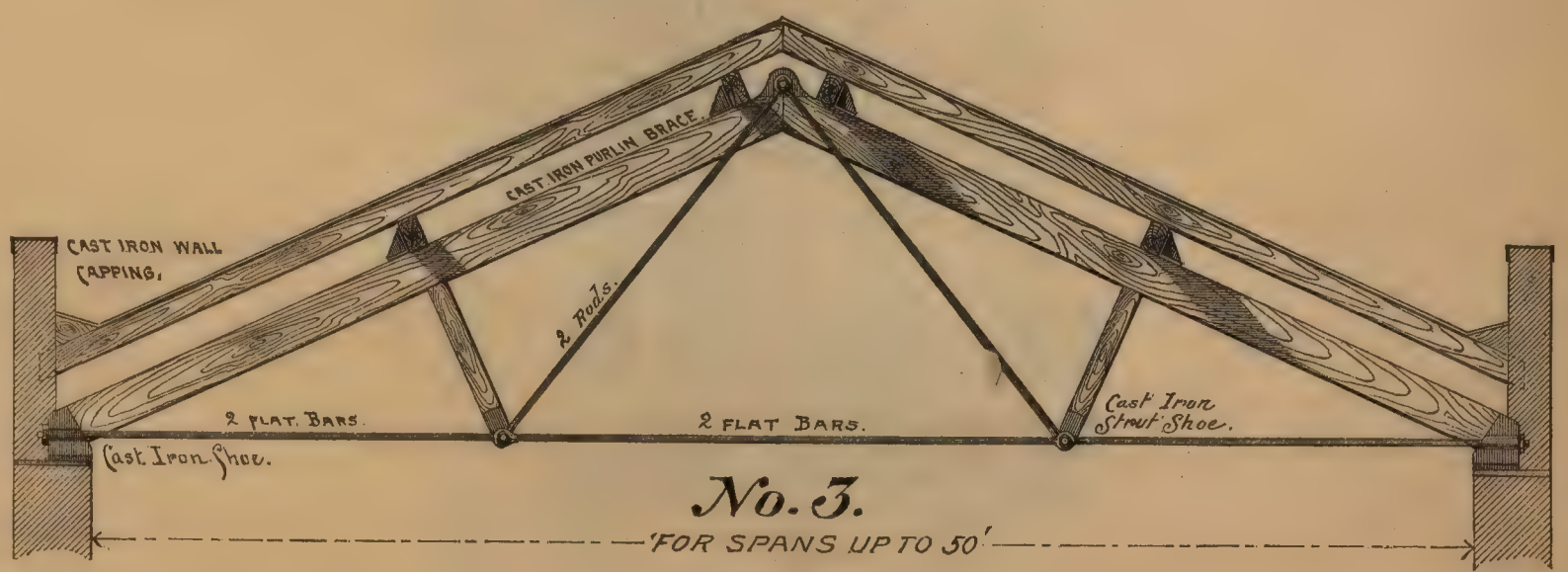
## Wrought Iron Roof Trusses




*No. 1.*

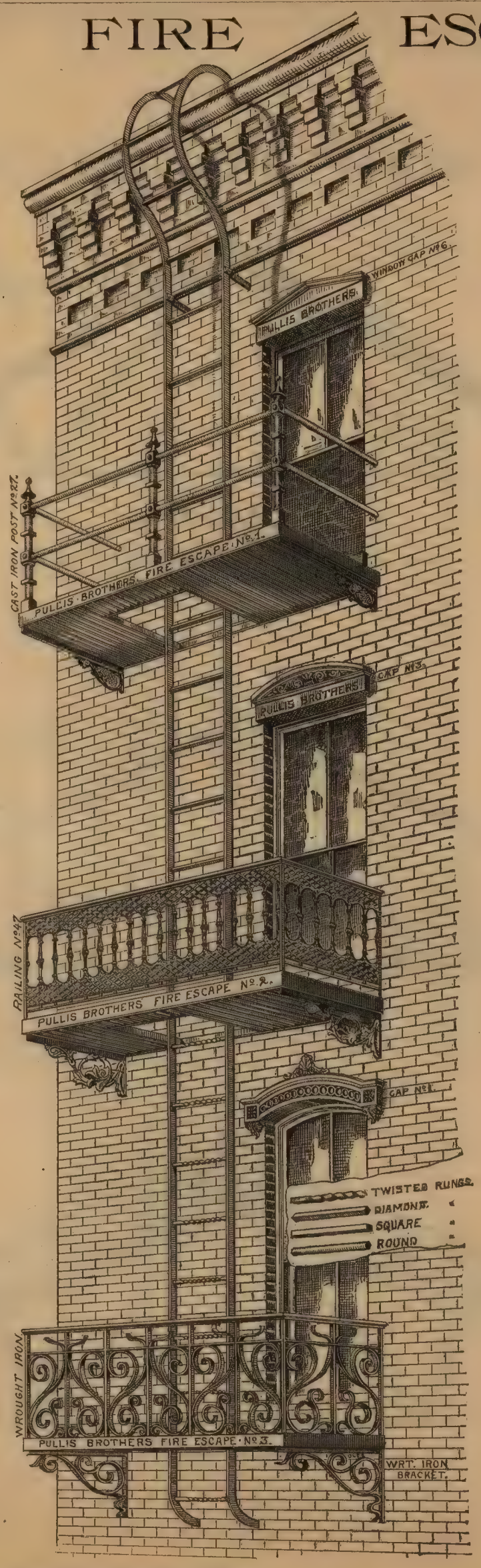



*No. 2.*




*No. 3.*

# FIRE ESCAPES.




Fire Escapes in any style or size, with and without Stand Pipes.

# WINDOW CAPS.

*No. 1.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
4 " 4 " Door Cap.

*No. 4.*

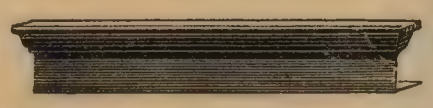
3 feet 2 inches opening.
3 " 5 "
3 " 8 "
4 " 6 "

*No. 7.*

3 feet 3 inches opening
3 " 5 "
No. 9, same style and same size of opening, but not so heavy.

*No. 2.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
3 " 11 "
4 " 6 " Door Cap.



*No. 5.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
3 " 11 "
Any length Door Cap.

*No. 8.*

3 feet 3 inches opening.
3 " 5 "
No. 10, same style and same size of opening, but not so heavy.

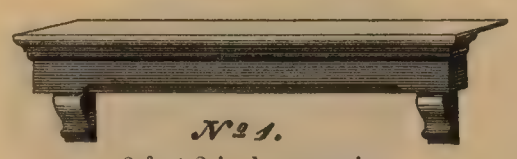
*No. 3.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "

*No. 6.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
6 " long Door Cap.

# WINDOW SILLS.

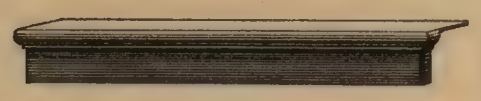


*No. 1.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
3 " 11 "

*No. 4.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
3 " 11 "



*No. 3.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
3 " 11 "

*No. 2.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
3 " 11 "

*No. 5.*

3 feet 2 inches opening.
3 " 5 "
3 " 8 "
3 " 11 "

We think the most fastidious can suit themselves, as to style, from the above collection, and after the selection is made and the caps or sills used, we have no fears as to the satisfaction they will give, as they are much more durable than wood or stone, and far cheaper.

Much dissatisfaction was formerly experienced by parties using caps or sills made of iron, on account of the disposition to corrode or rust, but this difficulty has been surmounted by the use of an improved oil and mineral paint, one coat of which is always applied before leaving our works. Subsequent painting does not interfere with this coat first given, as it will still retain its peculiar properties.

In ordering caps or sills, it would be well to bear in mind the following items: Give the size of the opening between brickwork, instead of ordering a cap or sill of a given length. Order and receive your caps before the frames are made, as it will insure a perfect fit. Endeavor to accommodate the size of the opening to the regular sizes of caps and sills given, for there will be an extra expense if we have to make them to special sizes.

FIRE PROOF SHUTTER,

**PLAIN AND CORRUGATED.**

Shutter Eyes, see page 63.

# Window Shutters and Doors.

A representation is hereby given of a Fire Proof Shutter, made in the ordinary way. We are prepared to fill all orders for this class of work with neatness and despatch. The advantage which a building enjoys in having its windows protected by iron shutters are obvious, especially in towns not provided with apparatus for extinguishing fires. Many have owed the salvation of their buildings from destruction by fire to their being protected by iron shutters. To parties objecting to them on account of their cost, we would say that the first cost of shutters is materially lessened by the fact that insurance companies discriminate in favor of buildings thus protected, and insure at lower rates. Parties sending us measures for opening need only be careful and get the neat opening of brick work, and, if segment head, the spring of the arch, we making our own allowance for lap, etc. In case the building has been built without eyes built in the wall, we can provide shutters to hang to a frame which is screwed to the hanging style of the wood frame, thereby effectually covering all the wood work. In sending measurements for the last mentioned style of shutters, send the same measure as first mentioned, but, in addition, send the width of hanging style on the face, and the distance the brick work extends beyond wood frame, so that we can prepare the hinge to throw around the brick work. We have furnished large quantities of such work to parties in the various States, and have always given satisfaction.

# Pullis' Patent Shutter Fastening for Fire Proof Shutters.

The importance of being able to get water to the flames in the early stage of a conflagration, no matter in what part of a building the fire may be raging, is self evident; and any device tending to accomplish this point is a public good, and should receive the support of the community.

No one will deny that Iron Shutters are a great protection to a building in case of fire in an adjoining building; but, suppose a large warehouse with each opening covered with Iron Shutters, and each Shutter, as usual, fastened from the inside, and the interior of the building on fire; if a stream of water could be thrown on the flames on the arrival of the engines, no serious damage might occur; but, if no means are at hand to open the shutters, the flames on the inside would soon get such headway that, by the time the shutters were opened, the building and contents would be a total loss.

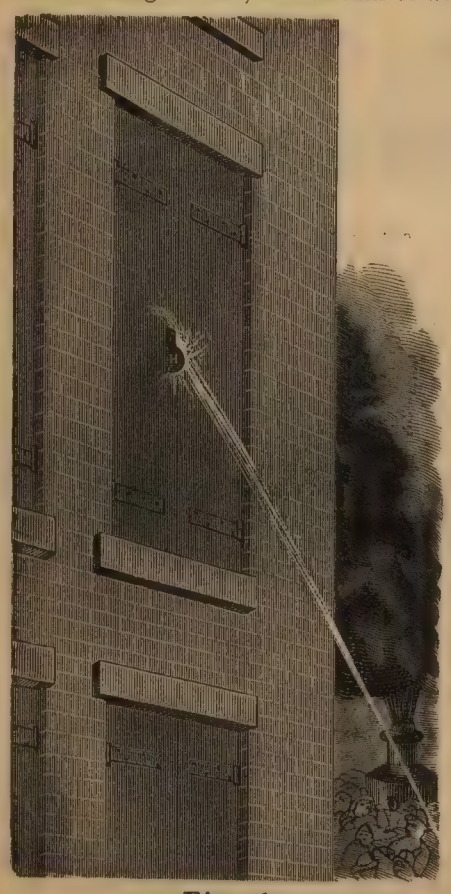


*Fig. 1.*

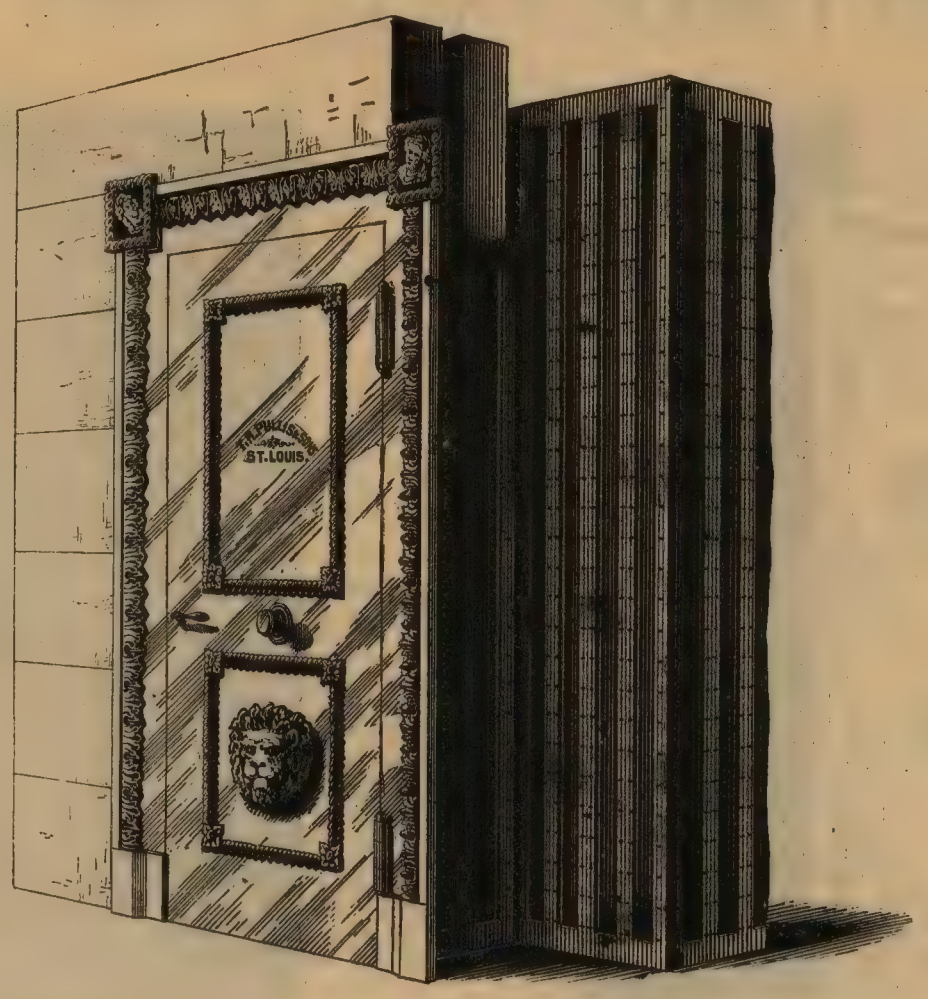
**Patented June 30th, 1874.**

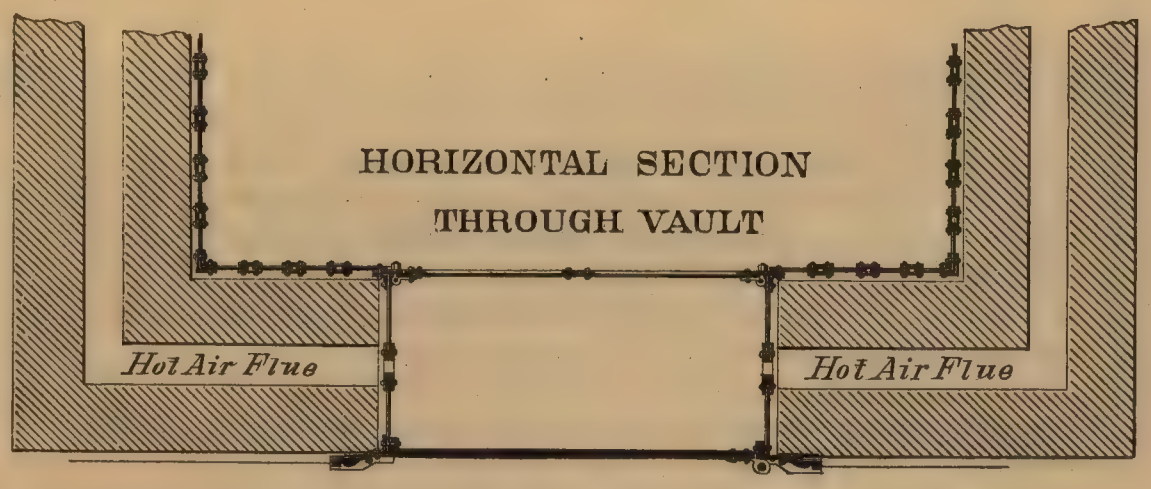
This invention is to overcome this difficulty. Figure 2 shows the arrangement of the Shutters on the inside. A B are the Shutters, formed of sheet iron, riveted to frames a a b b. C is a bar hinged to the Shutter B, and engaged under staple D D, secured to the Shutter B. The Bar C is held or supported in engagement with the catches D by a trip hook F, engaging a hooked lug G on the said bar; the shaft of the hook F passes out through the Shutter, and is provided with a downwardly projecting pendulum H, which, when oscillated or moved to one side, disengages the trip hook F from the lug G, and allows the bar C to descend out of engagement with catches D, so as to unlock the shutter. In its descent, the bar C strikes the inclined projection I, which is attached to shutter A, and forces said shutter open. K is simply a filling-out piece.

From this description, it will be readily seen that if a stream of water from the fire engine be directed against the pendulum H, as shown in figure 1, the bar C will be disengaged, and the Shutter A will open; the other Shutter B can be readily opened, if desired, by throwing a stream of water behind it.

*Fig. 2.*

# Bank Vaults and Fire Proof Vault Doors.




## FIRE AND BURGLAR PROOF BANK VAULT.

WE call special attention of parties contemplating the erection of buildings, who are desirous of having a receptacle for their valuables, books, papers, etc., which will be thoroughly fire and burglar proof.

We present a drawing which, we think, will give a correct idea of the construction of such a vault. The outer entrance door is made of two thicknesses of boiler iron, with one thickness of hardened steel between, furnished with combination lock. The two inner doors are made of boiler iron, forming a space between the outer and inner doors, connecting with the air flue in the hollow wall, which, in case of fire, will carry off the heat, and leave the interior of the vault unharmed.

This vault is made burglar proof by the interior lining, which is composed of strips of boiler iron about eight inches wide, battened in and out with strips about four inches wide and four inches apart.

The jambs of the entrance door are constructed the same as main lining of the vault.

The advantages of a vault constructed in this manner, over what is known as the "Cincinnati Vault," are apparent. Where a vault is constructed of plain boiler iron, a burglar, with his improved center bit, could soon cut out a hole large enough to admit his body; but the former arrangement completely prevents the use of such a tool.

# FIRE PROOF VAULT DOORS.

PLAIN FINISH.
*No. 1.*

*No 3.*

## Relative Value of Brick Vaults and Iron Safes.

THIS cut represents a Fire Proof Vault Door, as built into the wall of a brick vault. This is not intended to be burglar proof, but is simply a guard against fire. This, like the bank vault described on page 45, has its inner and outer doors, with space between, connecting with the hot air flue. A very prevalent custom is to place a burglar proof portable safe inside of this vault, to contain the money and other valuables, while books and less valuable papers can be placed on shelves inside the vault.

The great Chicago fire demonstrated the comparative worth of what is called Fire Proof Safes and Brick Vaults, and we herewith append an extract from the St. Louis Times of November 9th, 1871, on that subject:

"The Chicago fire has done much to exhibit the relative value of Iron Safes and Brick Vaults as places for the safe keeping of valuables. While the safes were comparatively worthless, the vaults generally preserved their contents in a perfect condition. Of course, the condition of the safes was due more or less to the intensity of the heat to which they were exposed. Some safes came out all right, while others of most improved manufacture, when opened, contained nothing but charred remains, or a handful of cinders. There is not a safe in existence that could have withstood the ordeal in certain localities. Some of them, heretofore considered indestructible, were cracked asunder and the contents prematurely destroyed. The exterior walls are like so much rusty iron, and will chip off in great flakes, while the interior of more than one of the larger safes are to-day so warm, one's hand suffers when placed in contact with them. The conclusion unavoidably arrived at is, the best Iron Safe is not near so secure as a properly constructed Brick Vault, with fire proof vault door."

We manufacture, and have on hand, the following sizes of Fire Proof Vault Doors of the design shown in cut:

Size of front opening { 6 ft. 0 in. x 26 in. / 6 ft. 0 in. x 30 in. / 6 ft. 6 in. x 27 in. / 6 ft. 6 in. x 30 in. } All 20 inches deep.

The Front shown is one finished in the plainest style, painted priming coat, and furnished with Cross Bolt Lock. We also have them, as shown on Bank Vault, with moulded architrave and panels, all nicely painted and furnished with Bramah Lock, or Combination Lock and side bolt work.

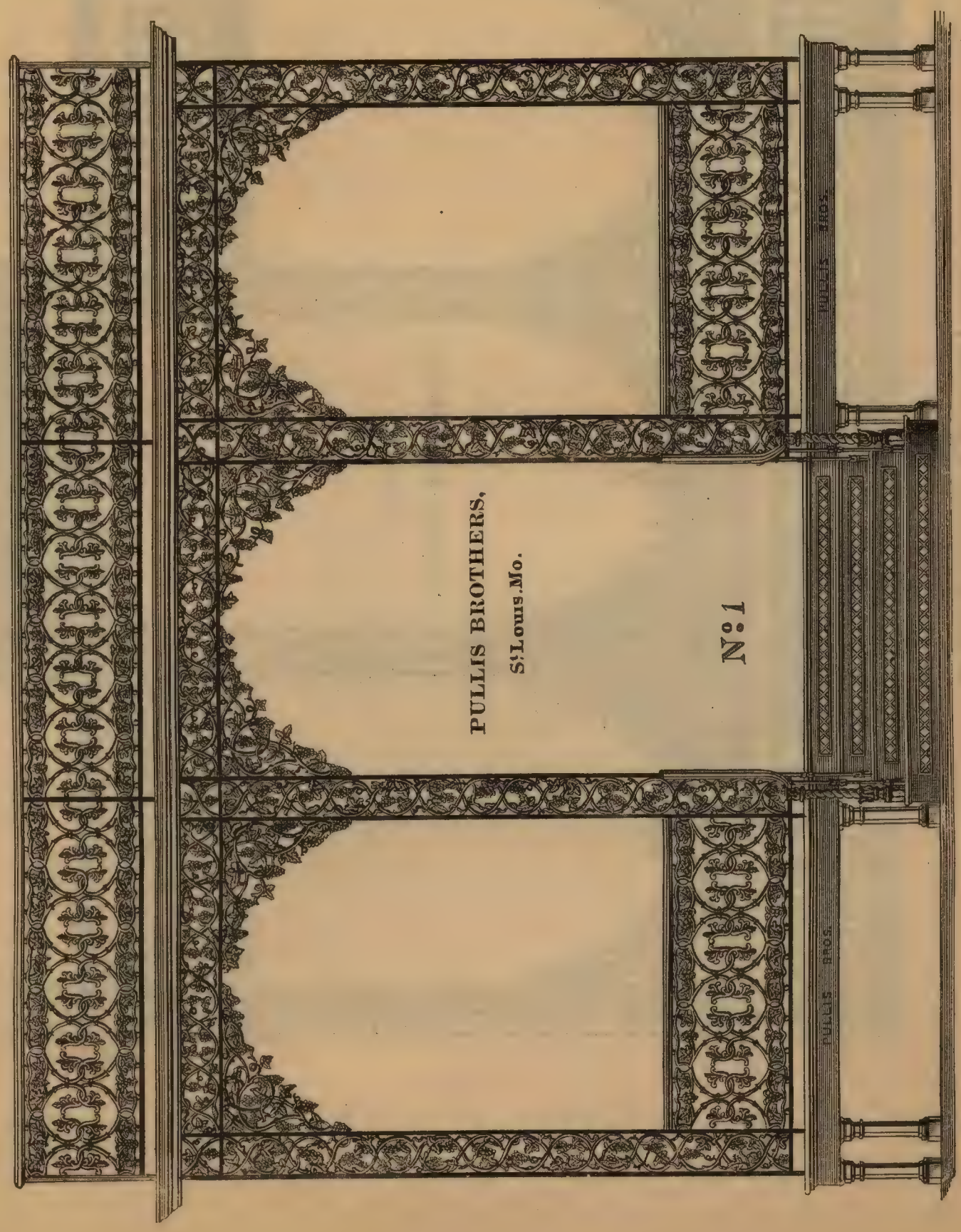
# VERANDAHS.

The great desideratum in Verandahs is to have lightness and ornament; and when wood is worked the lightness required to make the ornamental part symmetrical, the strength of the wood work is immediately destroyed, and the sun's rays, together with the changes consequent on damp and dry atmosphere, soon warp and destroy the Verandah. The cornice and frieze are intended to be made of wood.

Iron obviates these difficulties; and, although the price may be a trifle more than that of wood at first, in the end the iron will be the cheaper.

No. 3 is represented with a Railing on top, forming a Balcony reached from the second story.

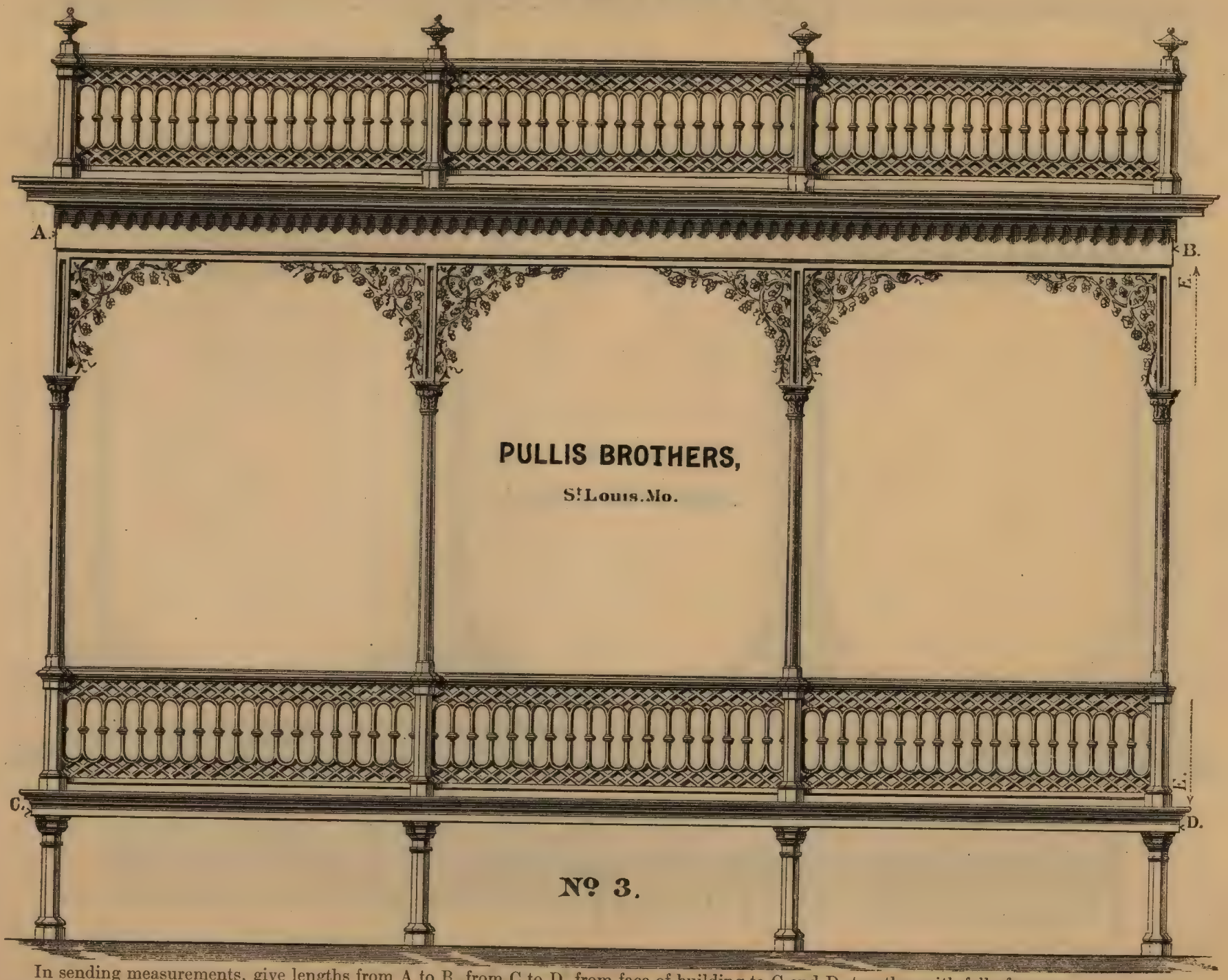
Too much care cannot be taken in sending measurements for this class of work, and the directions under Nos. 3 and 4 should be carefully and correctly complied with.



# VERANDAHS.

**№ 2.**

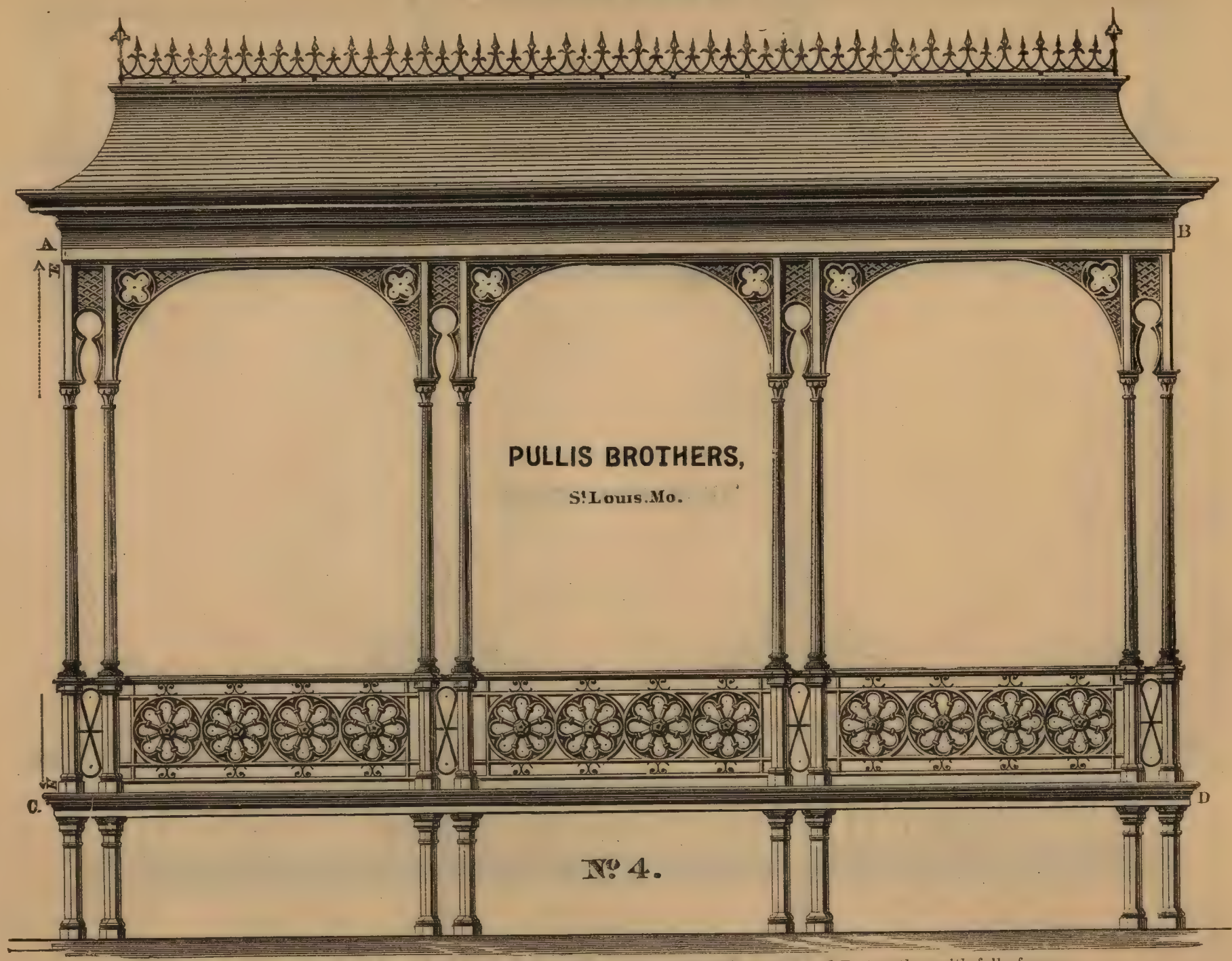
# VERANDAHS.




**No 3.**

In sending measurements, give lengths from A to B, from C to D, from face of building to C and D, together with fall of same.
Also height from E to E.

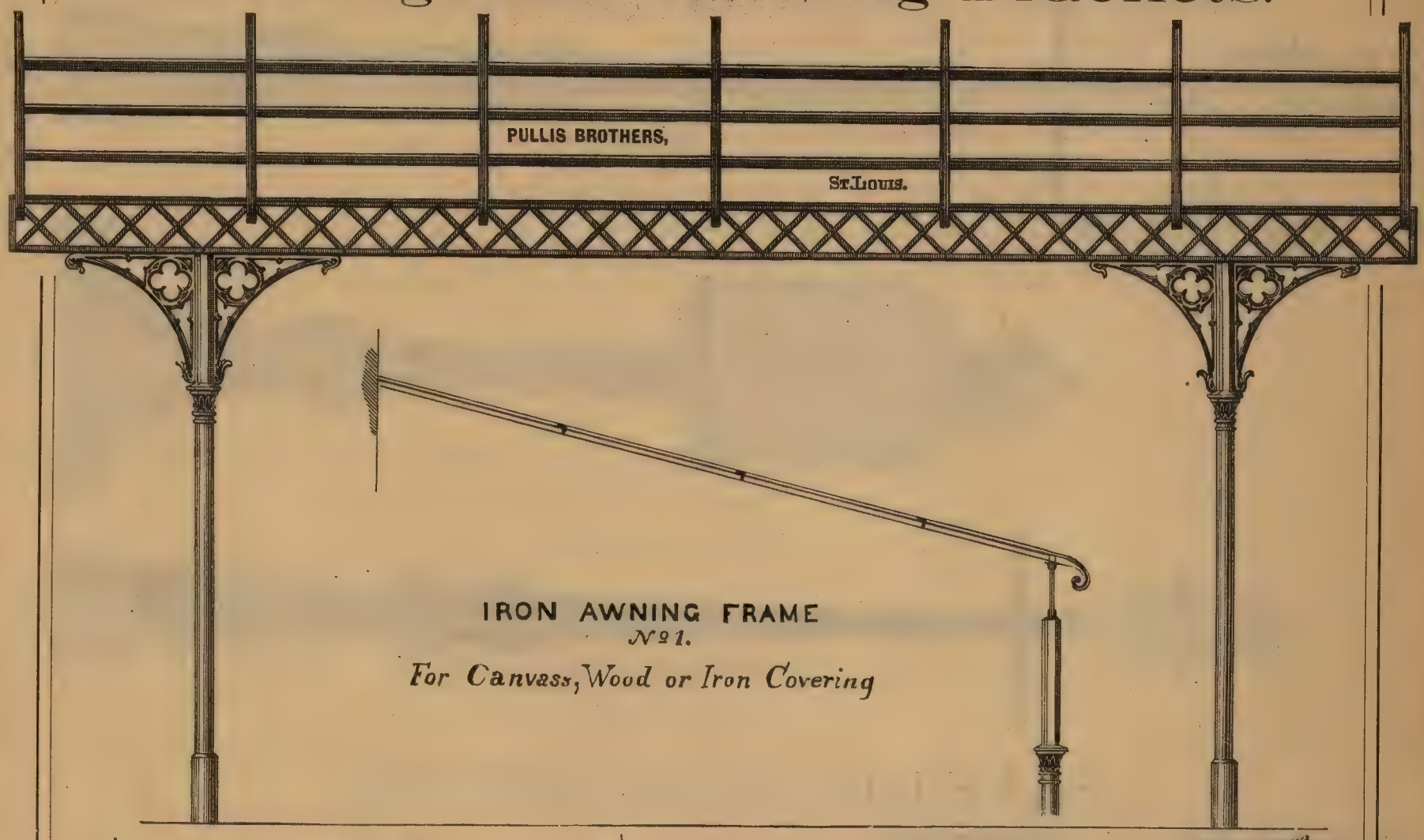
# VERANDAHS.




**№ 4.**

In sending measurements, give lengths from A to B, from C to D, from face of building to C and D, together with fall of same.
Also, height from E to E.

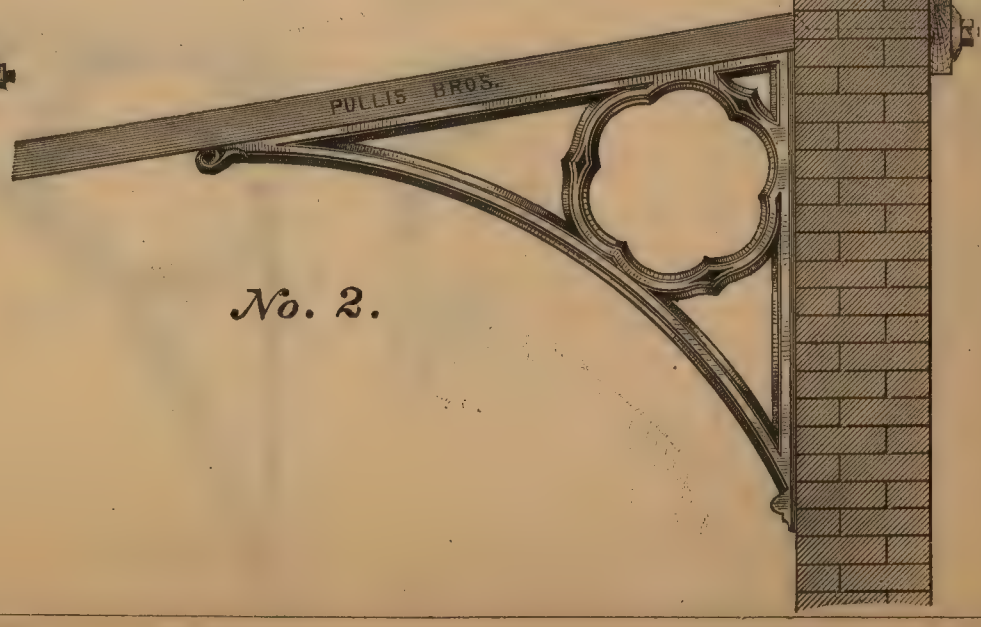
# Awnings and Awning Brackets.




IRON AWNING FRAME
*No 1.*
*For Canvass, Wood or Iron Covering*

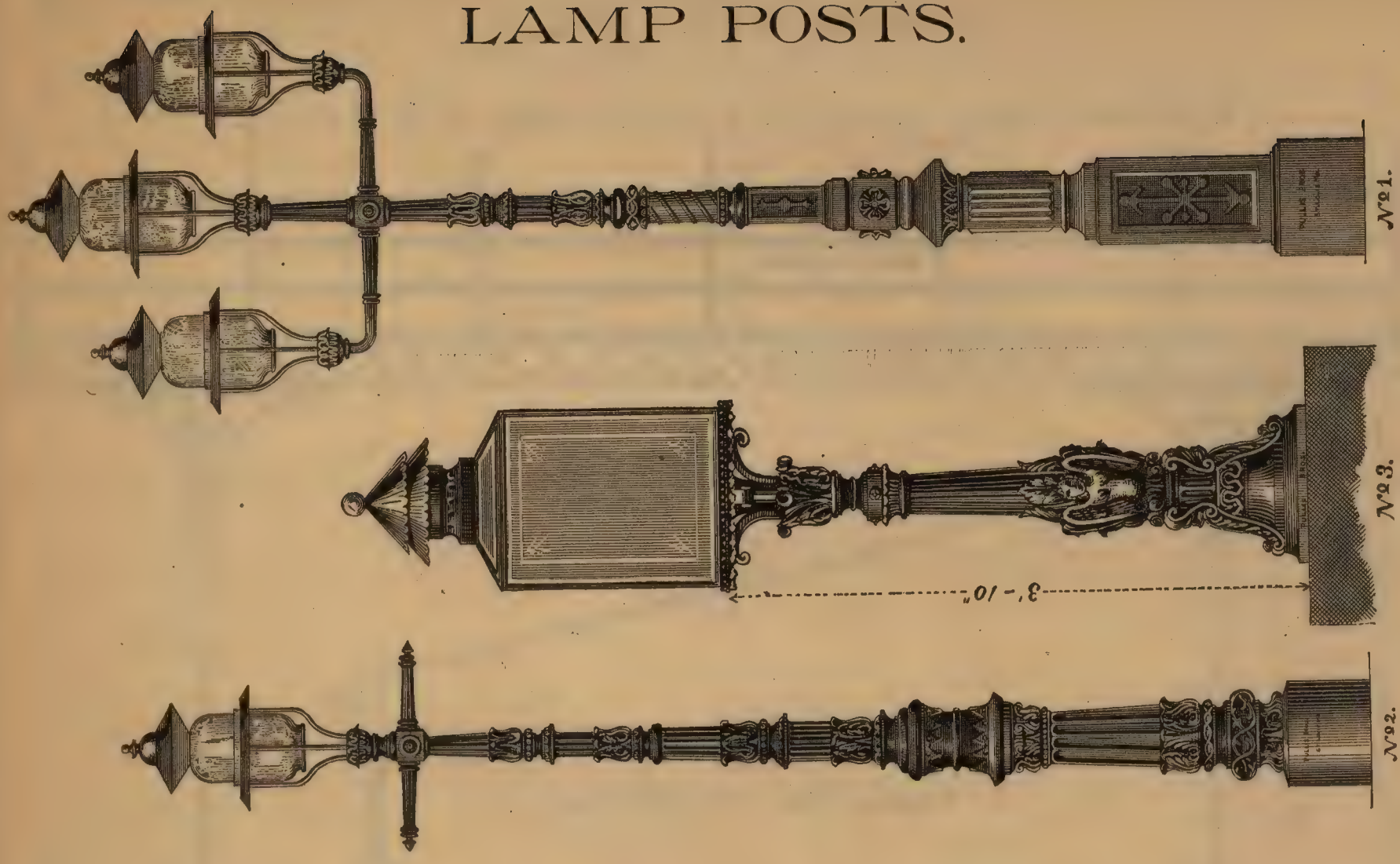
*No. 1.*

*No. 7.*

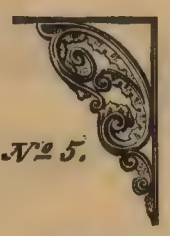



*No. 2.*

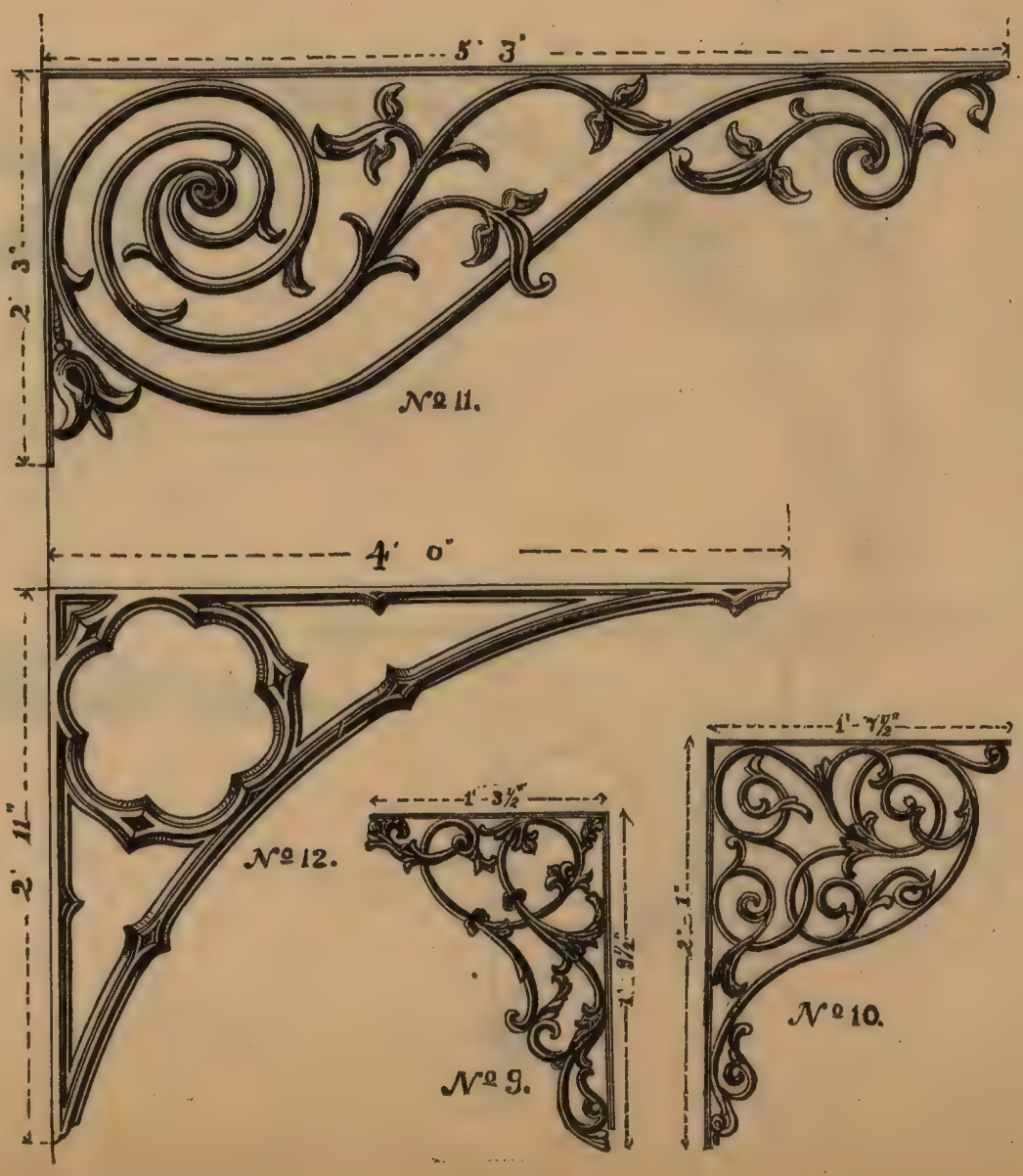
# LAMP POSTS.




# SHELF BRACKETS.



No. 1, 12½ inches projection.
" 2, 11½ " "
" 3, 7¾ " "
" 4, 7½ " "
" 5, 6 " "
" 6, 5½ " "
" 7, 6 " "



# Balcony Bearers.

4 Ft. 6" Out.

No. 4.

3 Ft. Out.

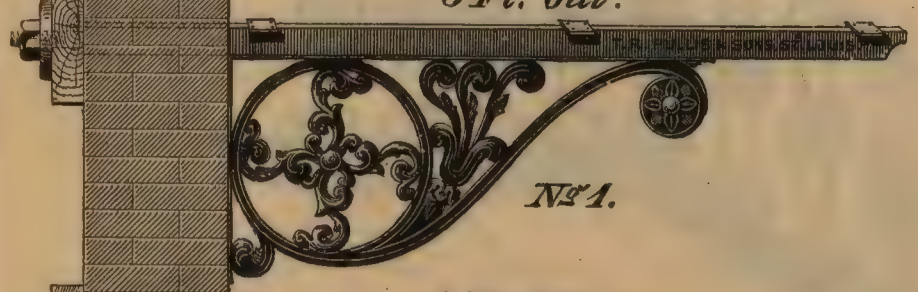
No. 2.

3 Ft. Out.



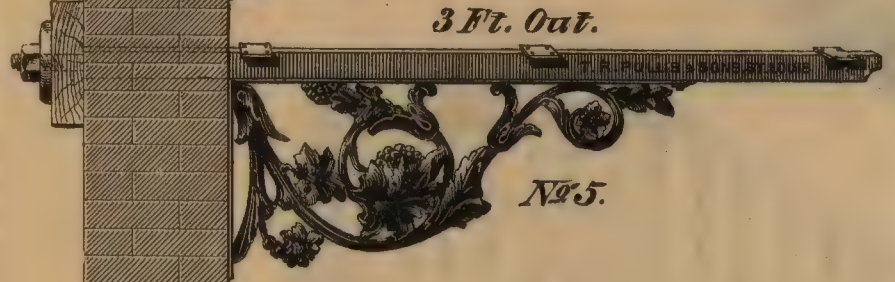
No. 3.

3 Ft. Out.



No. 1.

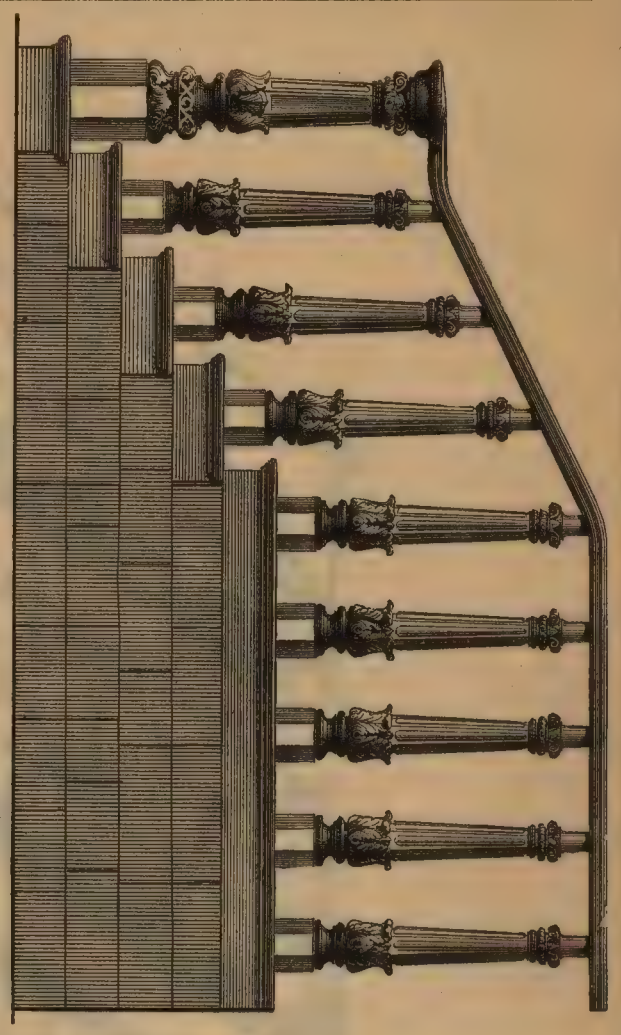
3 Ft. Out.



No. 5.

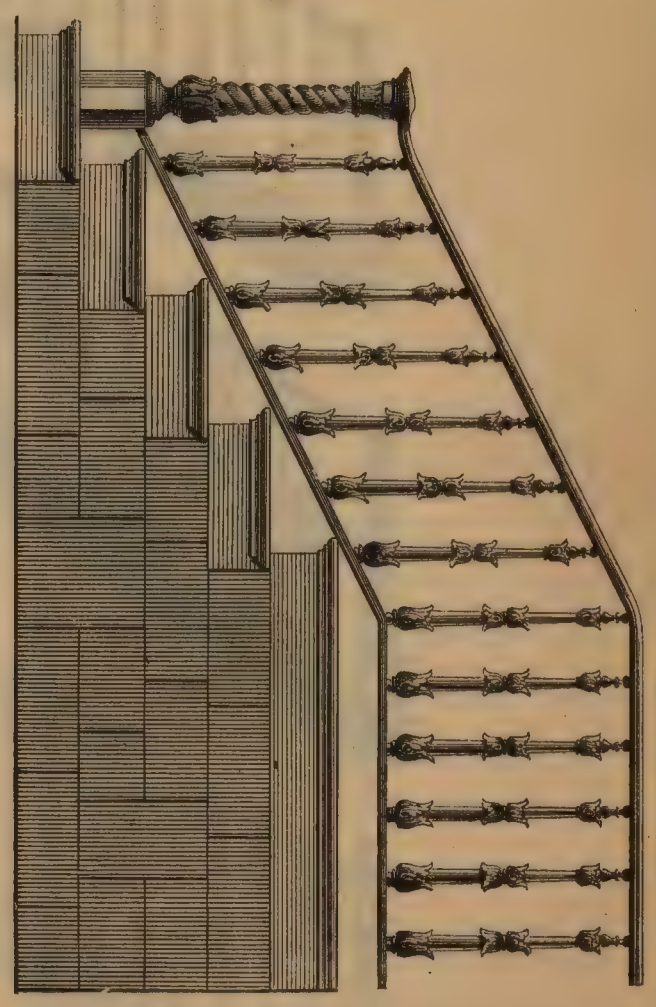
3 Ft. Out.

No. 6.



No. 1.

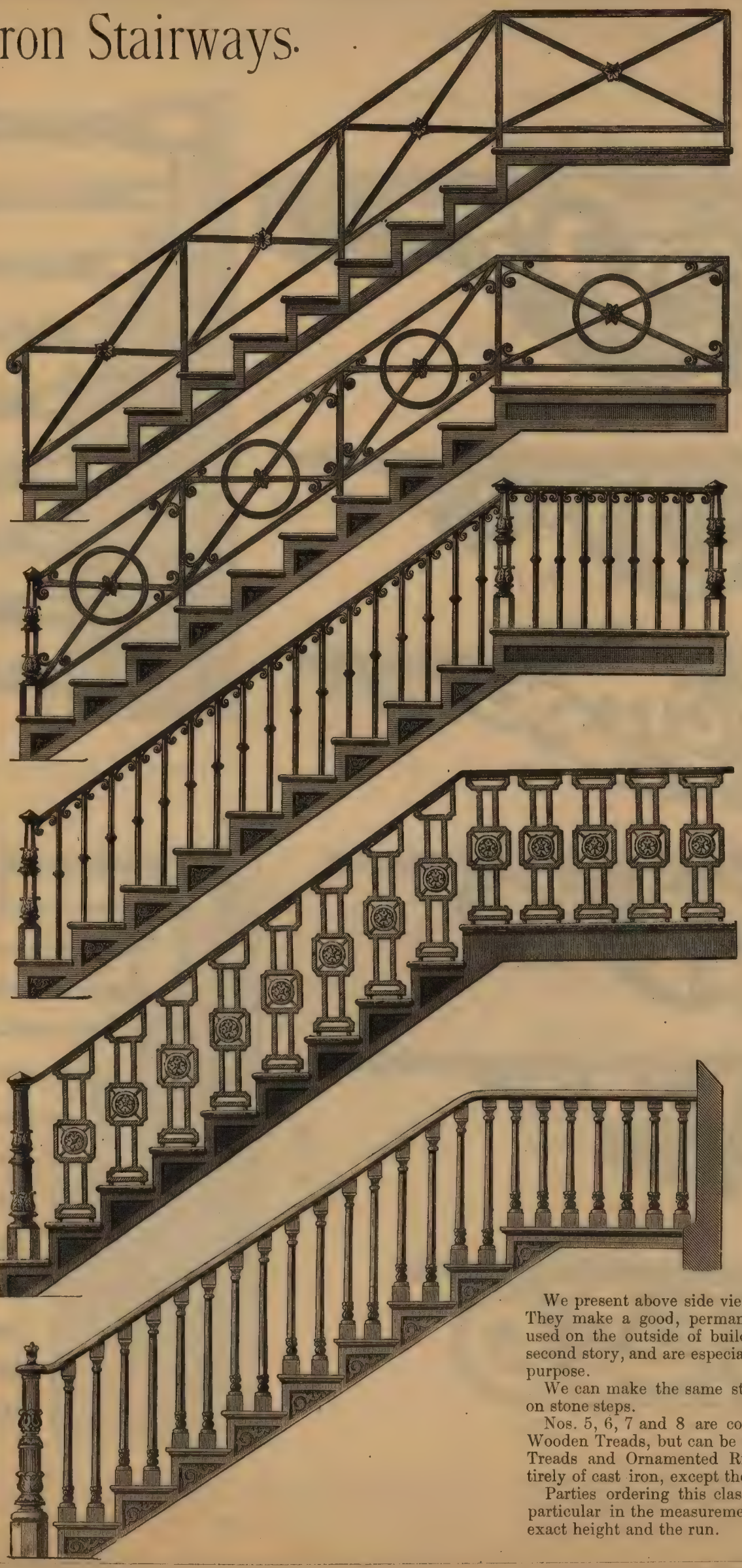
# Iron Stairways.



No. 3.

The above Balcony Bearers are represented as running through the front wall of the building and one joist. If they are to come on the side of the building and extend parallel with the joist, it must be so stated, and they will then be made so as to spike on the side of the joist. In sending orders, the thickness of the wall they are to run through should be stated. Nos. 1, 2, 3 and 5 for 9, 13 and 18 inch wall, are kept in stock; can, however, be made to order up to 4 feet out.

# Iron Stairways.



No. 5.

No. 6.

No. 7.

No. 8.

No. 9.

We present above side view of Iron Stairways. They make a good, permanent Stairway, to be used on the outside of buildings leading to the second story, and are especially designed for that purpose.

We can make the same style of Railing to go on stone steps.

Nos. 5, 6, 7 and 8 are constructed to receive Wooden Treads, but can be made with Cast Iron Treads and Ornamented Risers. No. 9 is entirely of cast iron, except the strings.

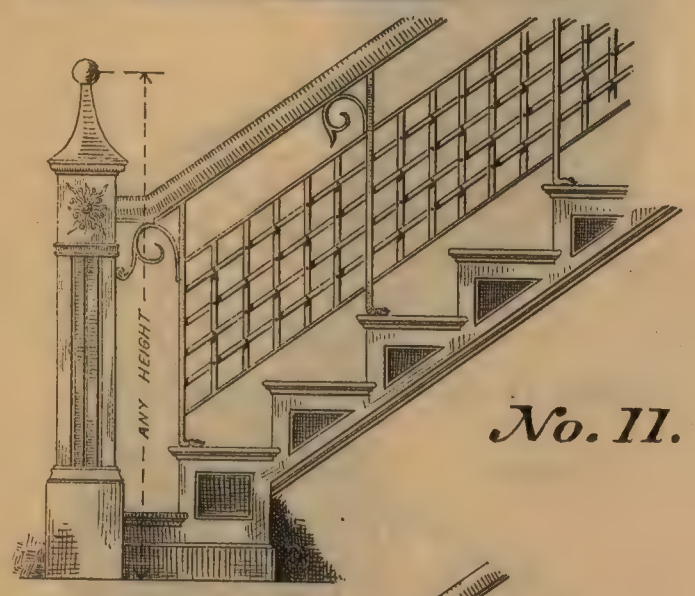
Parties ordering this class of work should be particular in the measurements sent, giving the exact height and the run.

# Stair Work
## of every description.

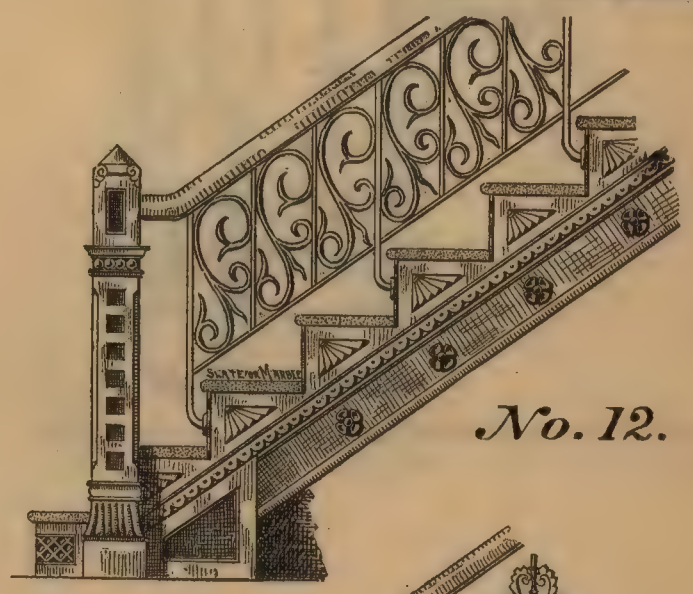
*No. 10.*



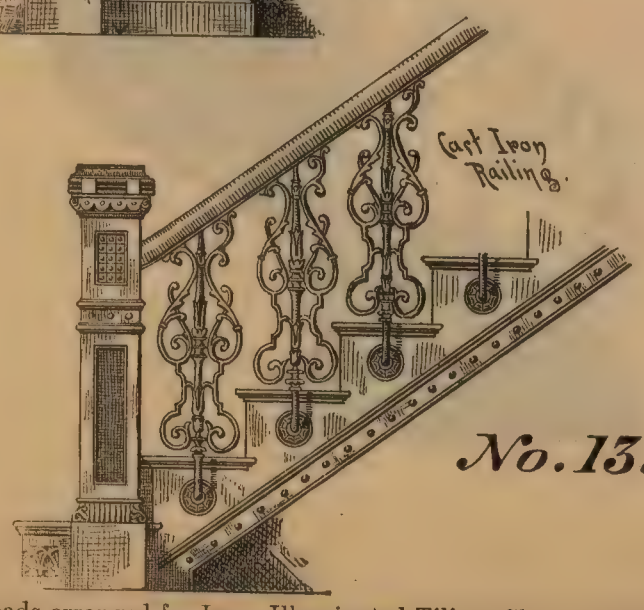
*Plan.*



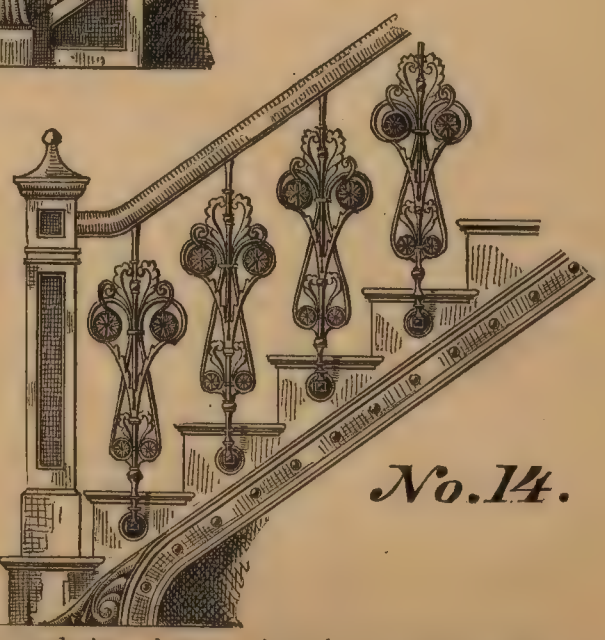

*No. 11.*



*No. 12.*




*No. 13.*

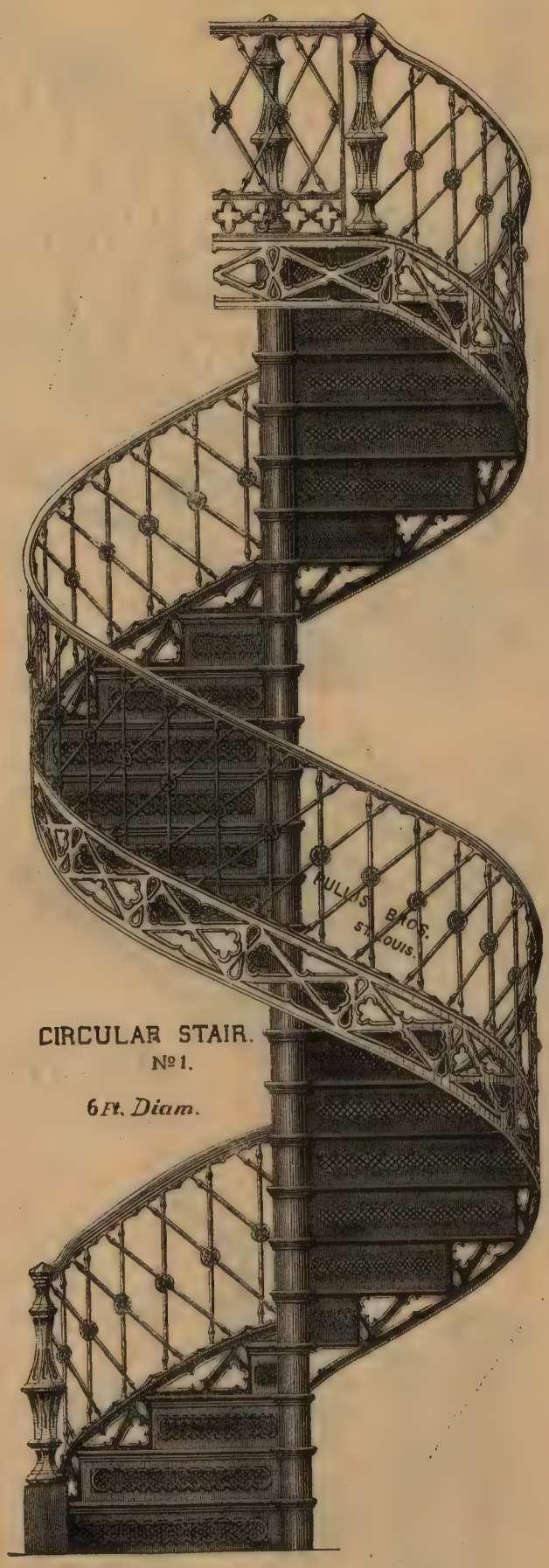


*No. 14.*

Treads arranged for Iron, Illuminated Tiling, Slate, Marble or Wood. Stairs of any design, shape or size, of wrought or cast iron.

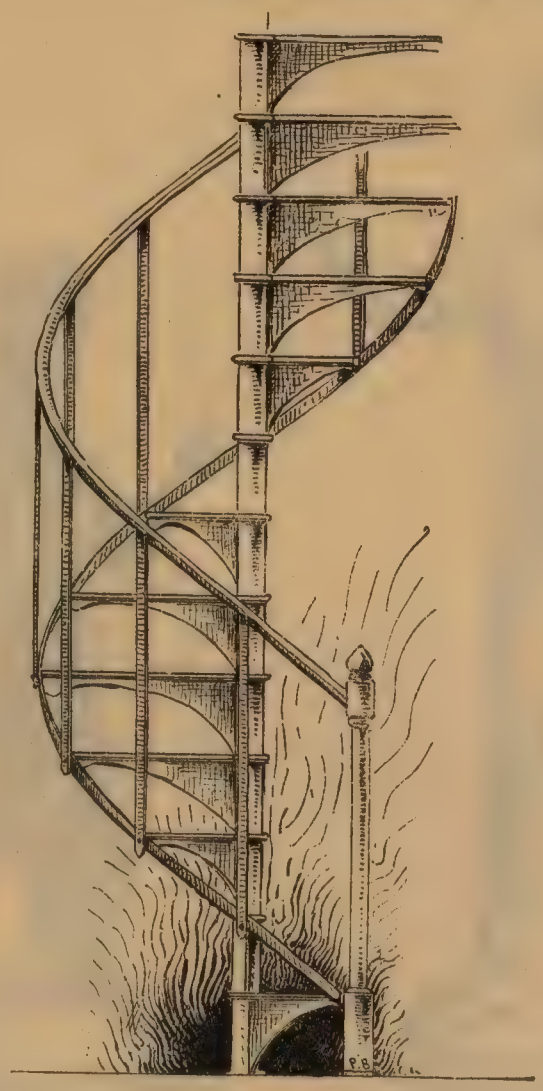
# CIRCULAR STAIRS.

**No. 2.**




CIRCULAR STAIR.
№ 1.
*6 Ft. Diam.*

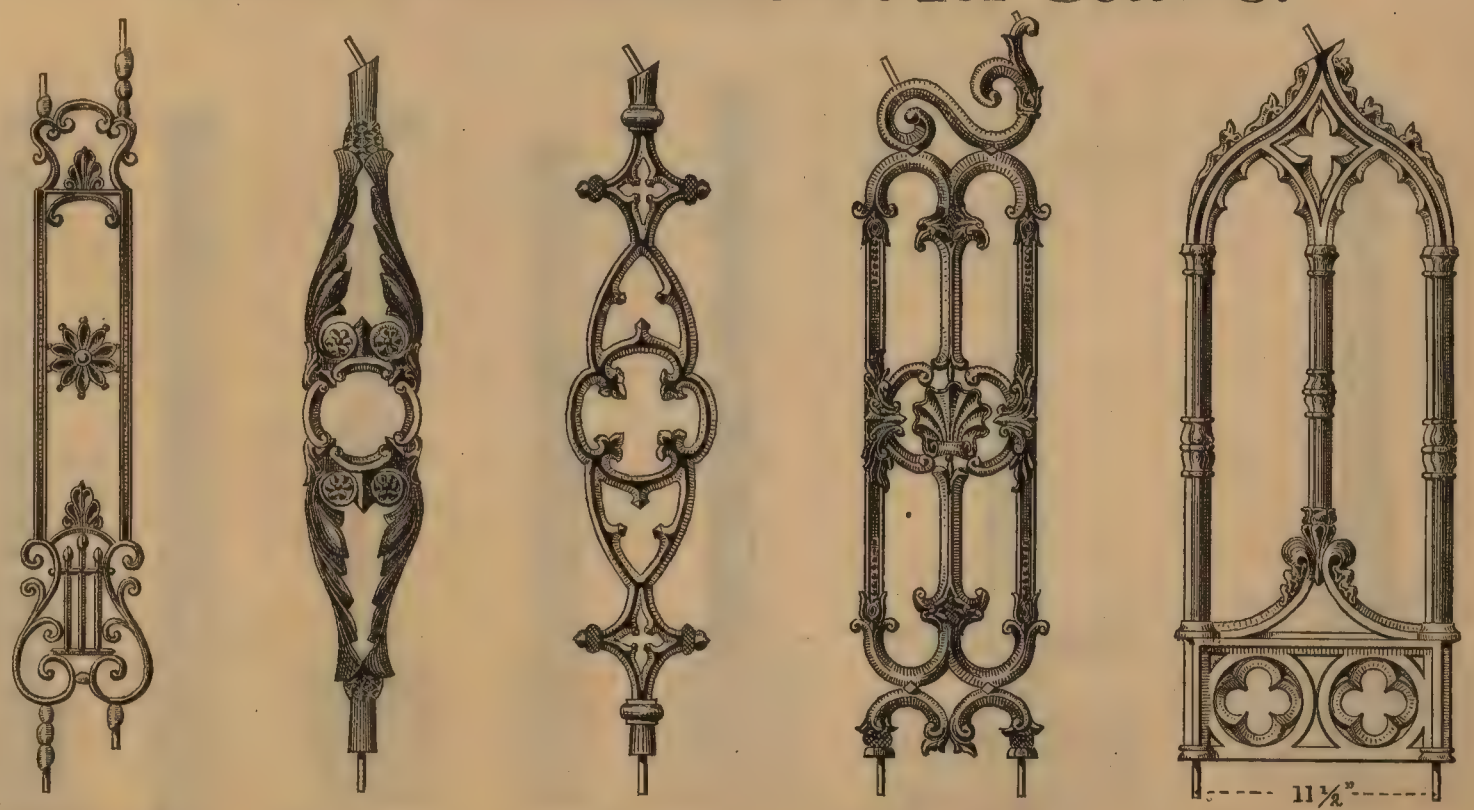
# CIRCULAR STAIRS.



*No. 3.*

*No. 4.*

## *Cast Iron Balusters for Stairs.*

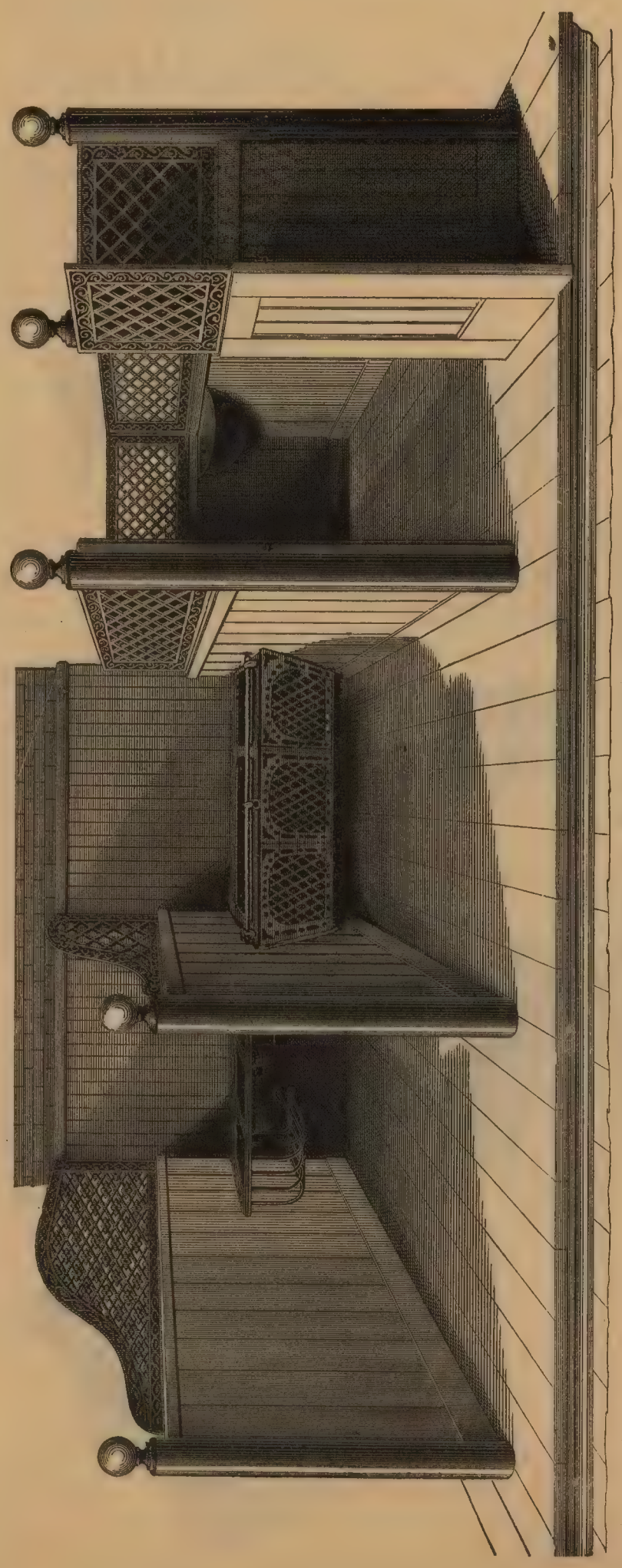



**No.16.** **No. 51.** **No.14.** **No.103.** **No.107.**

# HITCHING POSTS.

*No. 1.* *No. 2.* *No. 3.* *No. 4.* *No. 5.* *No. 6.* *No. 7*

# STABLE FITTINGS.



## DESIGN FOR A RANGE OF STALLS.

Shown in left hand Stall.

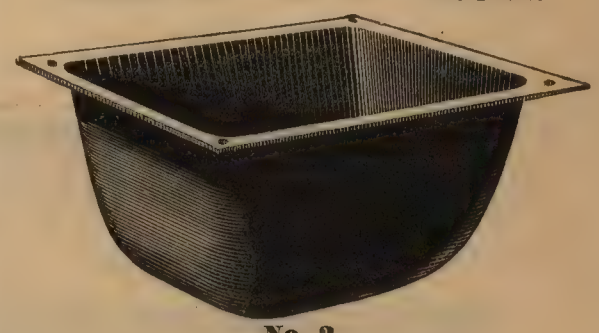
Each Stall can be made 8 feet, or longer. The Posts at end of Stall are of iron.
No. 1 Cast Stall Guard, 7 feet 8 inches by 2 feet 6 inches. Shown at extreme left in above cut.
No. 5 Cast Stall Guard, 5 feet 11 inches by 2 feet 5 inches. Shown next to the right of No. 1 Stall Guard.
No. 1 Manger, 4 feet 11 inches long by 22 inches wide. Consisting of Hay Rack, Oat Trough and Water Trough.
No. 2 Manger, 5 feet long by 20 inches wide. Consisting of Hay Rack and Oat Trough. Shown in centre Stall.

### SQUARE BOTTOM OAT TROUGH.

**No. 1.**

With round Corners.
20½ inches by 16½ inches by 10 inches deep.

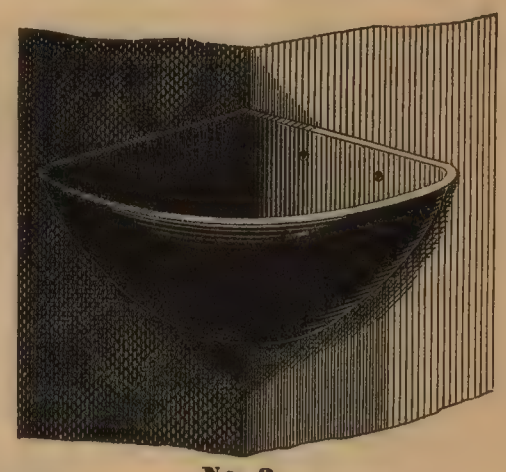
### ROUND BOTTOM OAT TROUGH.



**No. 2.**

18½ inches by 12½ inches by 10 inches deep.

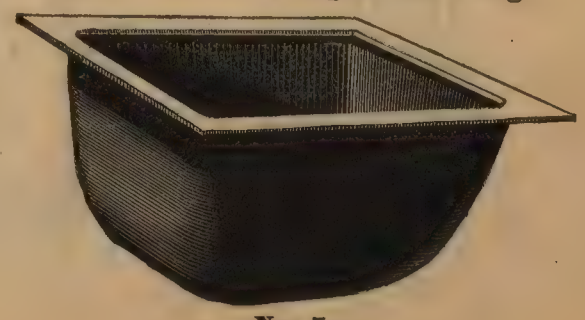
### CORNER FEED TROUGH.



**No. 3.**

17 inches by 17 inches by 10 inches deep.

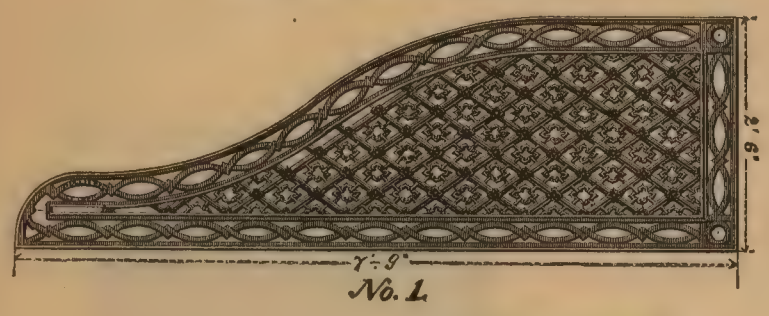
### Round Bottom, Flanged Oat Trough.



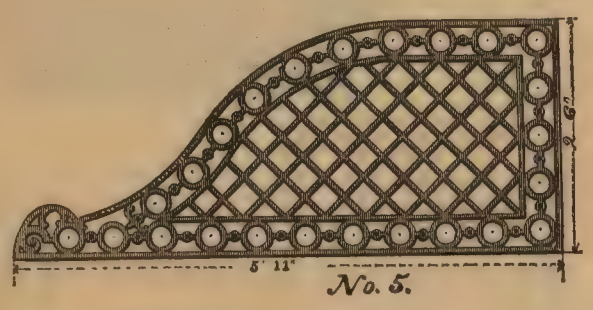
**No. 5.**

# STABLE FITTINGS.

## CAST STALL GUARDS.




*No. 1.*




*No. 5.*

## STABLE GUTTER.

*No. 1.*

STABLE GUTTER.
*No. 2.*

## TREE BOXES.

*No. 2.*
TREE GUARD

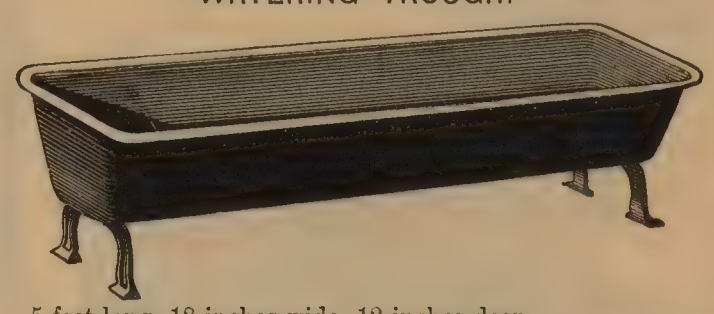
TREE BOX.
*No. 1.*

## WROUGHT BAR STALL GUARD.

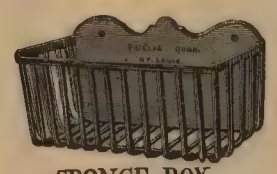
*No. 2.*

Made any size to order.
This drawing is made from one on hand.
8 feet long by 2 feet 6 inches high.

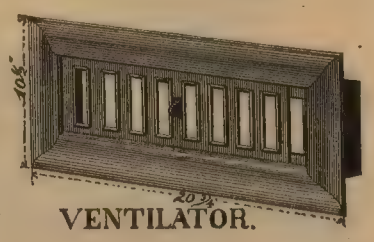
## WATERING TROUGH.



5 feet long, 18 inches wide, 12 inches deep.
Provided with outlet at bottom for wood plug.
An indispensable article for Livery and Private Stables.

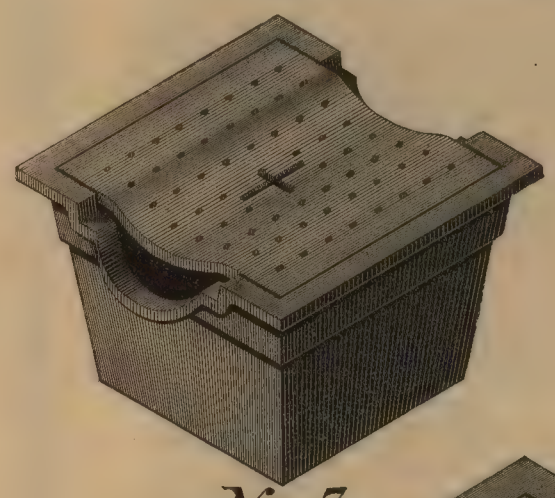


SPONGE BOX.

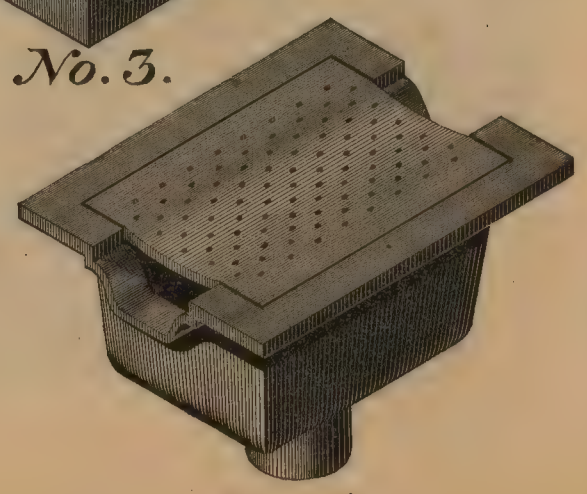



VENTILATOR.

## STABLE BELL TRAPS.



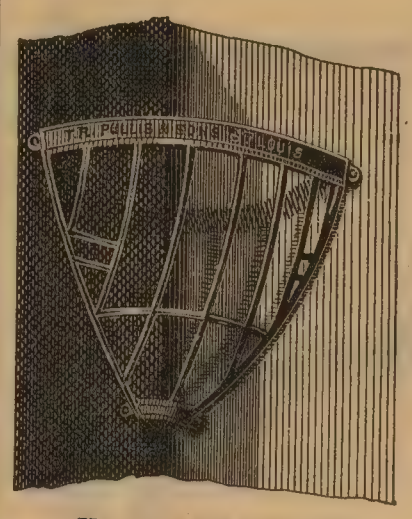
*No. 3.*



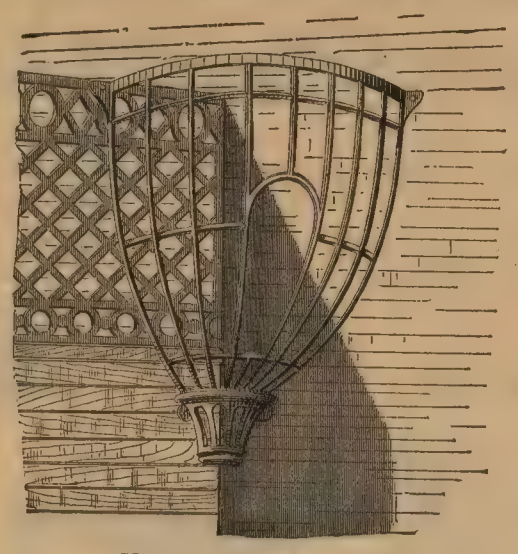
*No. 4.*

# STABLE FITTINGS.

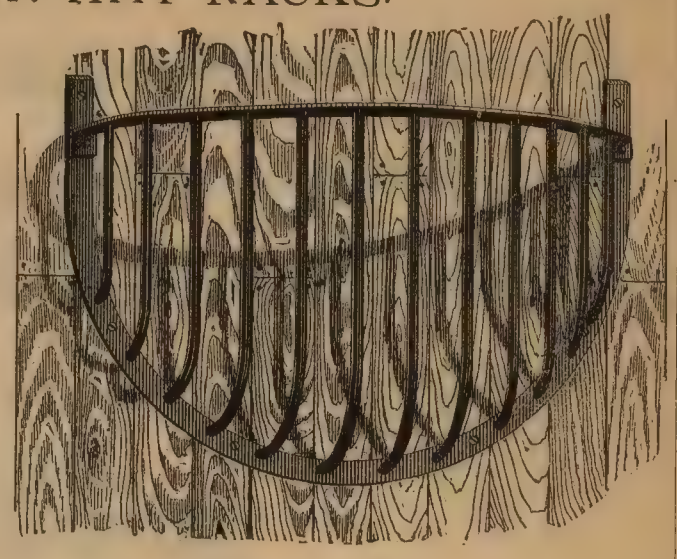
## CAST AND WROUGHT IRON HAY RACKS.



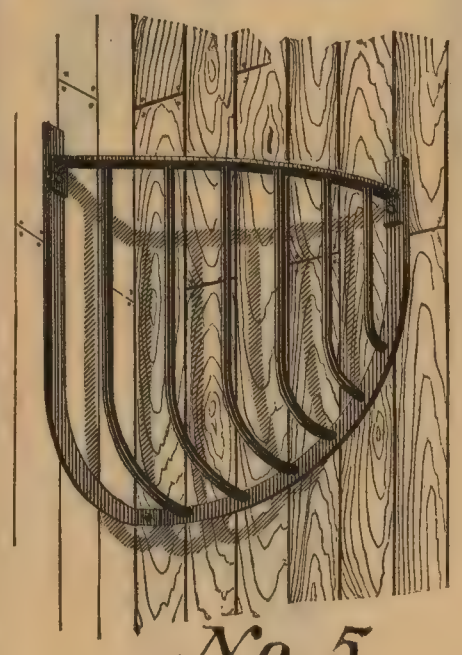
**No. 1.** 2 feet 2 ins. high.



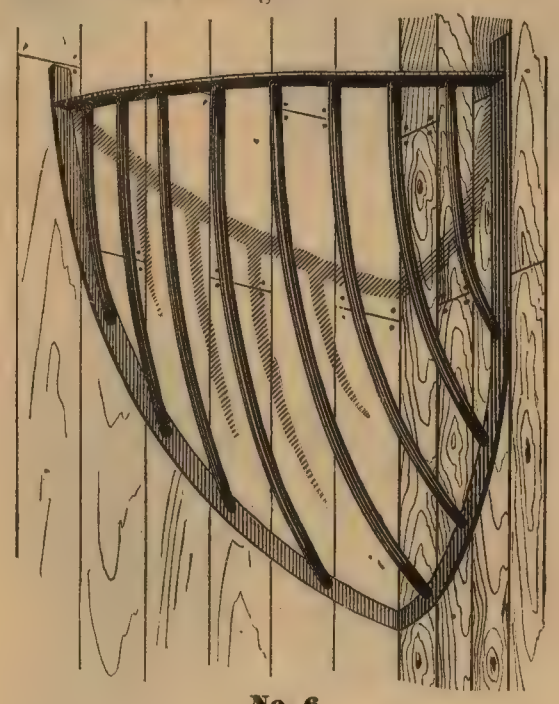
**No. 2.** 3 feet 6 ins. high.



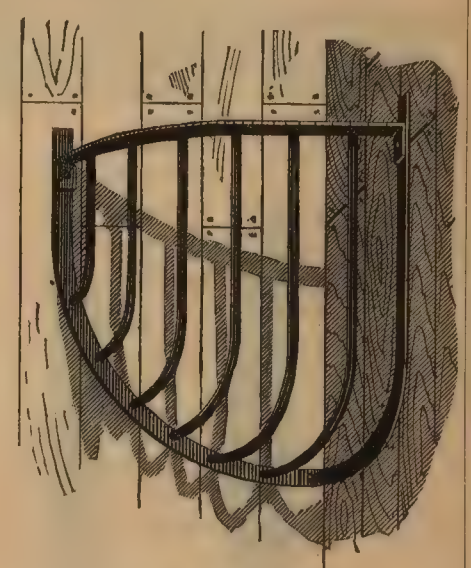
*No. 3.*



*No. 5.*

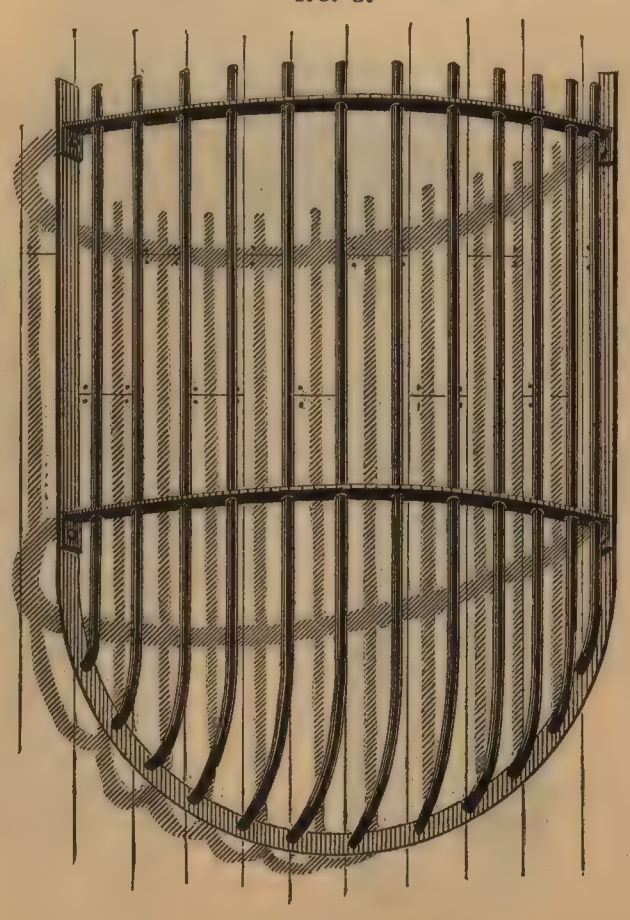


**No. 6.**



*No. 4.*

*No. 8.*



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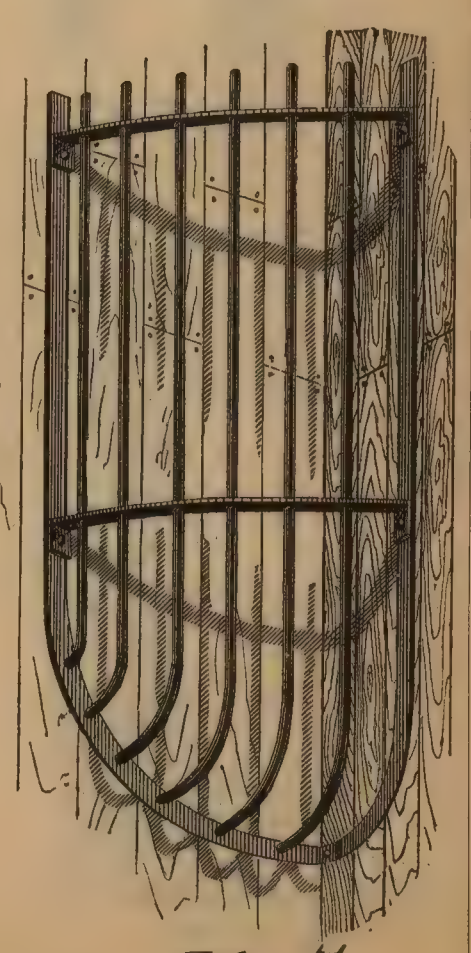
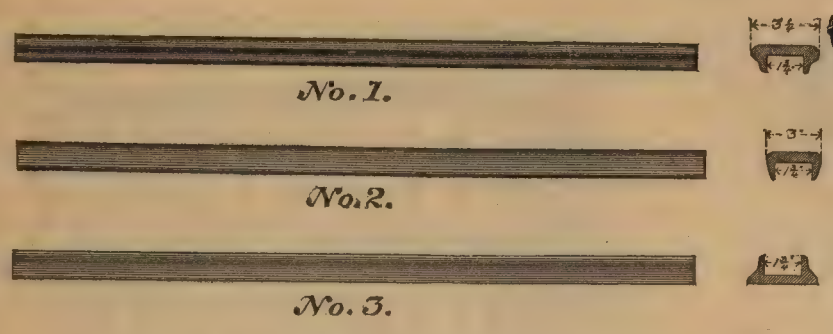
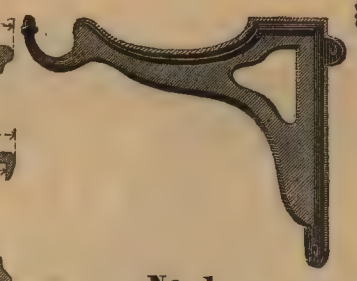


*No. 7.*

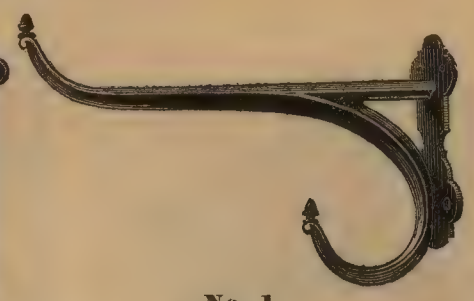
# STABLE FITTINGS.




TOP AND BOTTOM RAILS FOR STALL PARTITIONS.



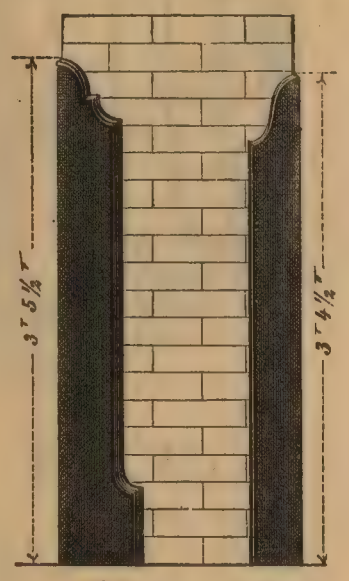
**No. 1.**
**HARNESS BRACKET.**



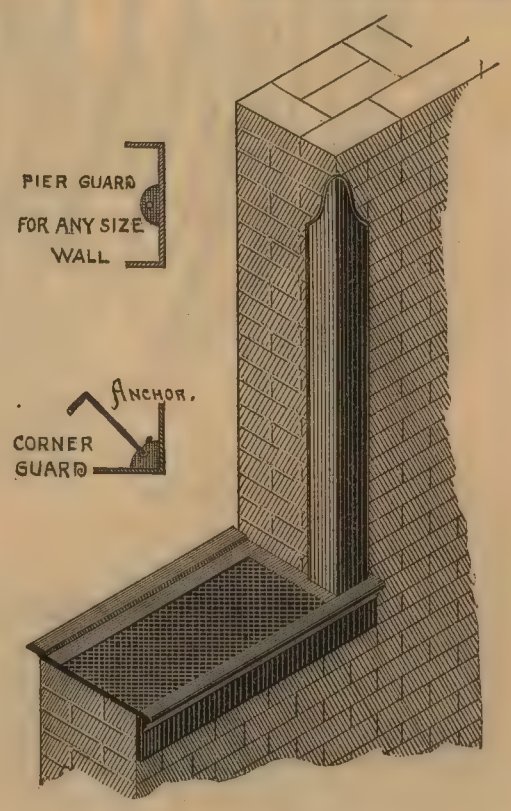
**No. 1.**
**SADDLE AND BRIDLE BRACKET.**

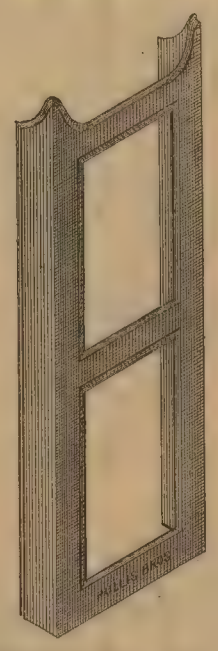
**No. 2. Harness Bracket.**

**No. 2. Saddle and Bridle Bracket**

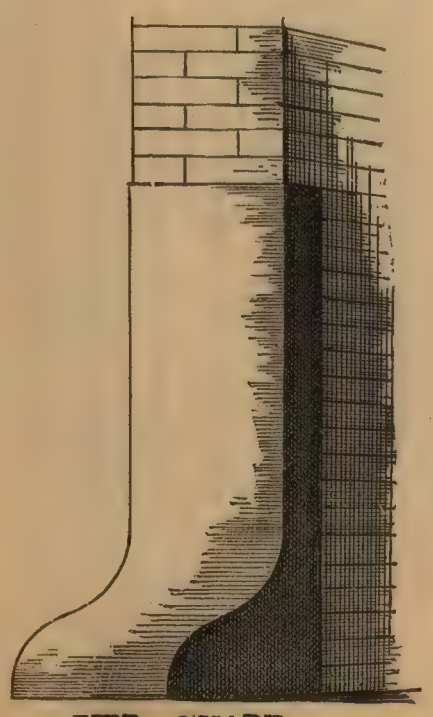



**1. 2**
**CORNER GUARDS.**
For protecting Brick Piers.



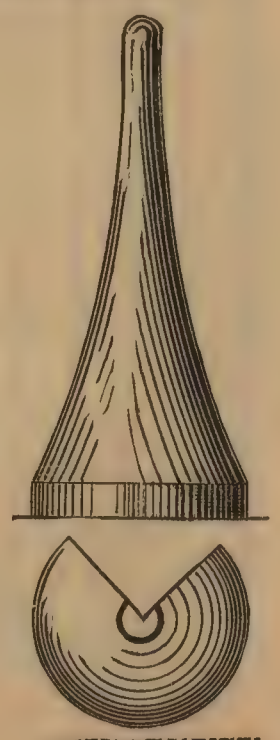

**PIER GUARD. No. 4.**



**PIER GUARD.**
**No. 1.**

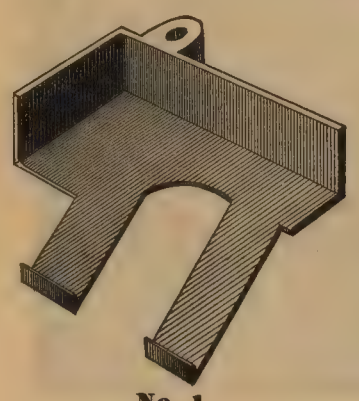
**WHEEL GUARD.**
**No. 2.**

**WHEEL GUARD.**
**No. 3.**

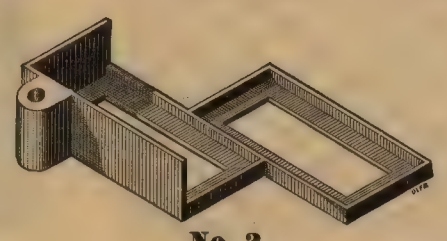


**CARRIAGE-WHEEL**
**GUARD.**

# Hinges, Eyes and Stirrups.



No. 1.



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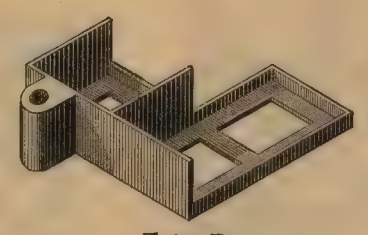

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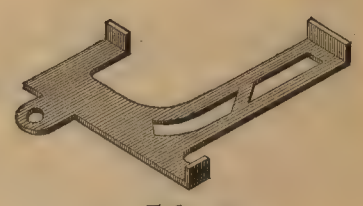

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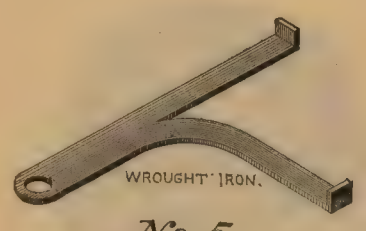


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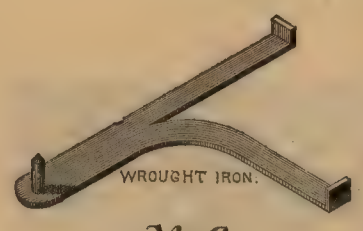


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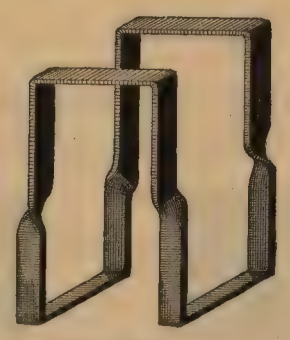
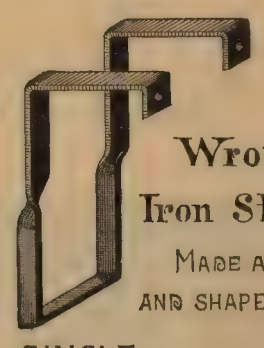


DOUBLE



SINGLE.

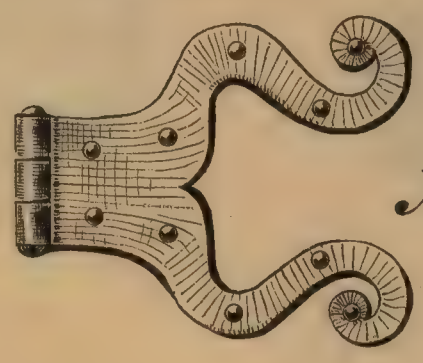
**Wrought Iron Stirrups**

MADE ANY SIZE AND SHAPE REQUIRED.

## Wrought Iron Hinges.

*No. 1.*

*No. 2.*



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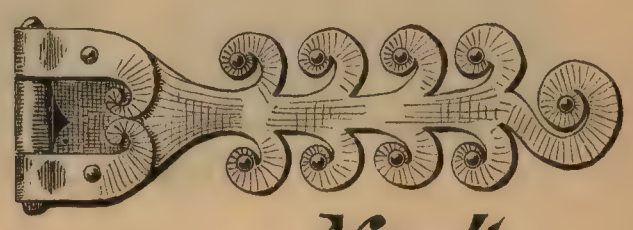

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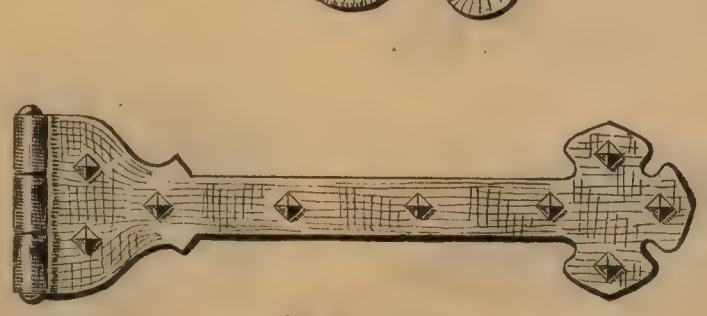

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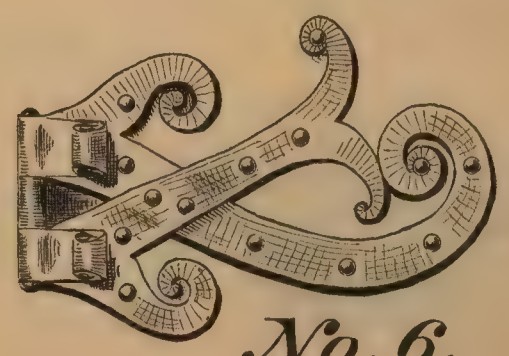
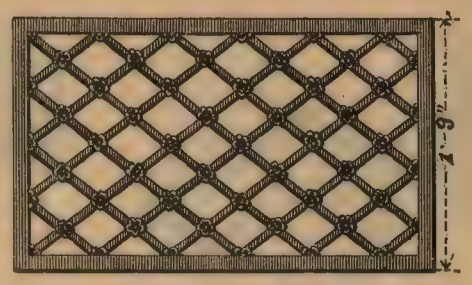


*No. 6.*

ALL STYLES OF FANCY WROUGHT AND CAST HINGES. ALSO MADE IN BRASS, COPPER AND BRONZE.

# Grilles, Ventilators and Registers.

**No. 1.**

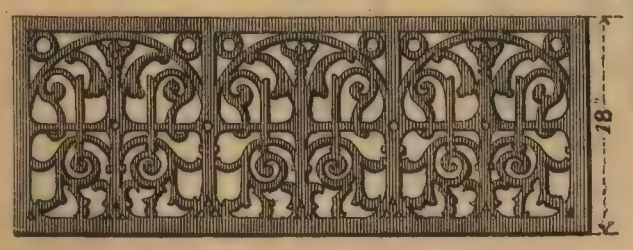



**No. 2.**

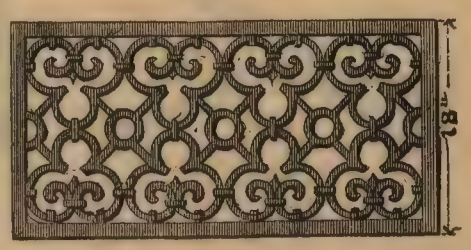
**SQUARE REGISTER. All Sizes.**

## GRILLES FOR SHOW WINDOWS.

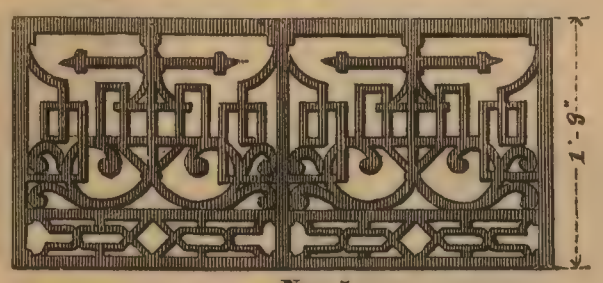
ANY LENGTH OR WIDTH.



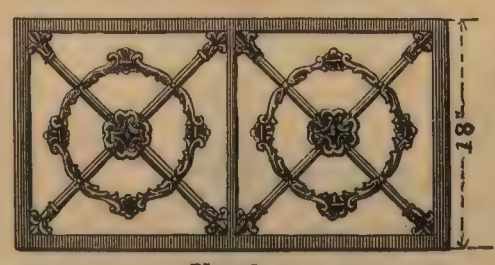

**No. 3,**



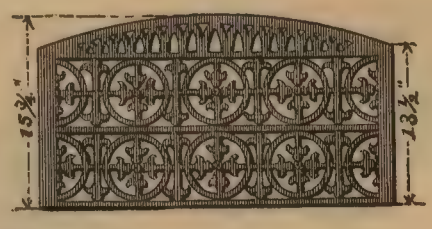

**No. 4.**




**No. 5.**

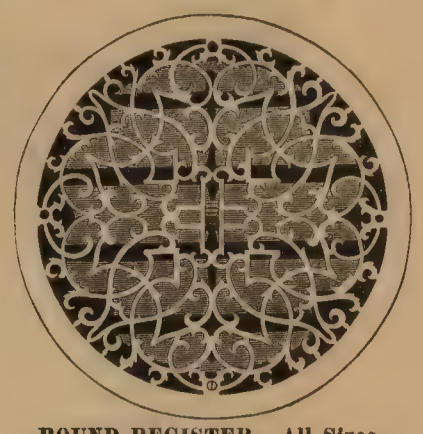



**No. 6.**



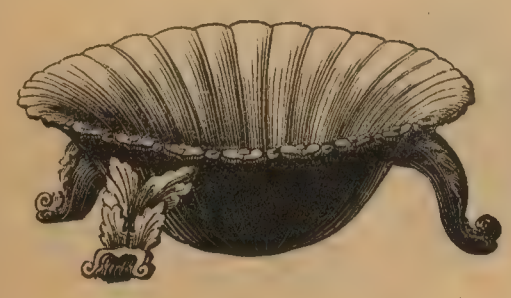

## VENTILATORS.

**ROUND TOP REGISTER. All Sizes.**

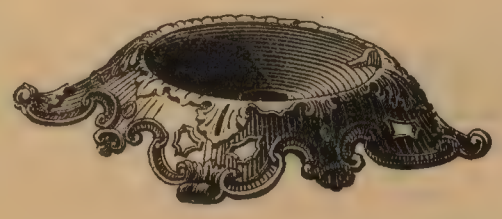


**ROUND REGISTER. All Sizes.**

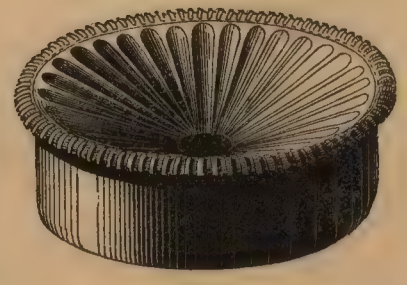
# SPITTOONS.



*No. 1.*



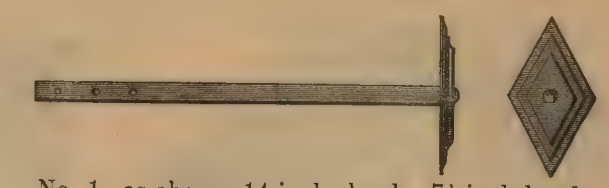
*No. 2.*



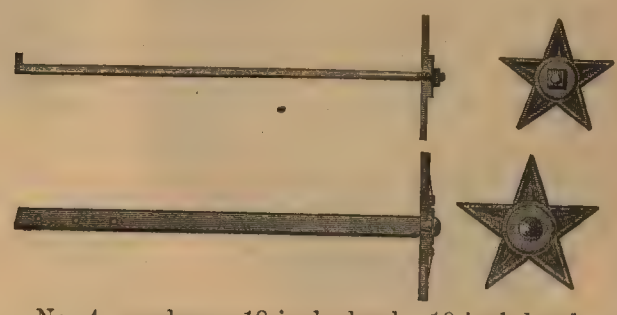
*No. 3.*

ENAMELED. BLACK OR PAINTED GREEN.

# ANCHORS AND ANCHOR HEADS.



No. 1, as above, 14 inch shank, 7½ inch head.
" 2, " 18 " 9 "
" 3, " 20 " 10 "

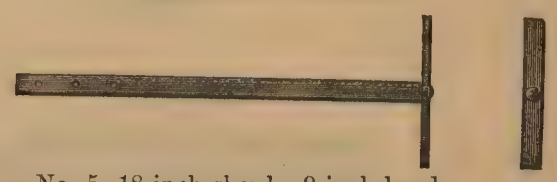


No. 4, as above, 18 inch shank, 10 inch head.
" 6, " 14 " 7 "

**Strap for Wood Girder.**

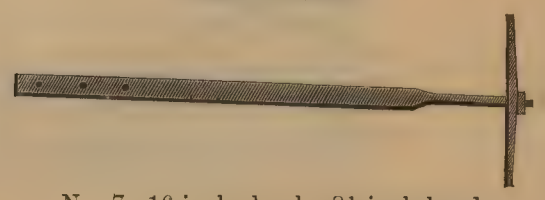
2 feet and 2 feet 6 inches long.

**Blind or T Anchor.**



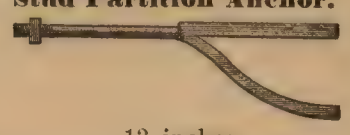
No. 5, 18 inch shank, 9 inch head.
" 11, 24 " 10 " heavy.

**Bolt Anchor.**



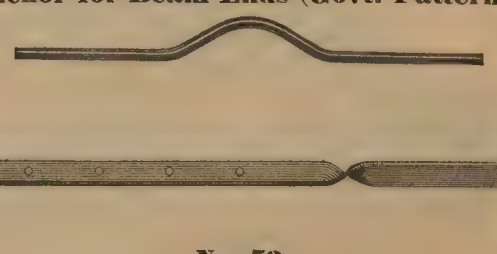
No. 7, 16 inch shank, 8½ inch head.
" 8, 30 " 10 "

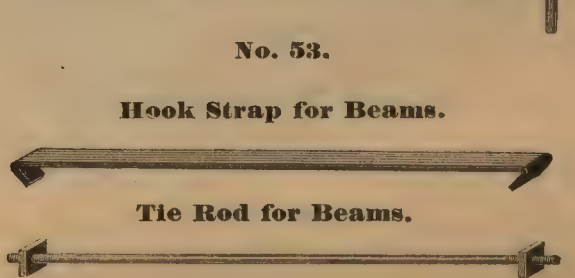
**Stud Partition Anchor.**



13 inches.

**Anchor for Beam Ends (Govt. Pattern.)**





No. 53.

**Hook Strap for Beams.**



**Tie Rod for Beams.**

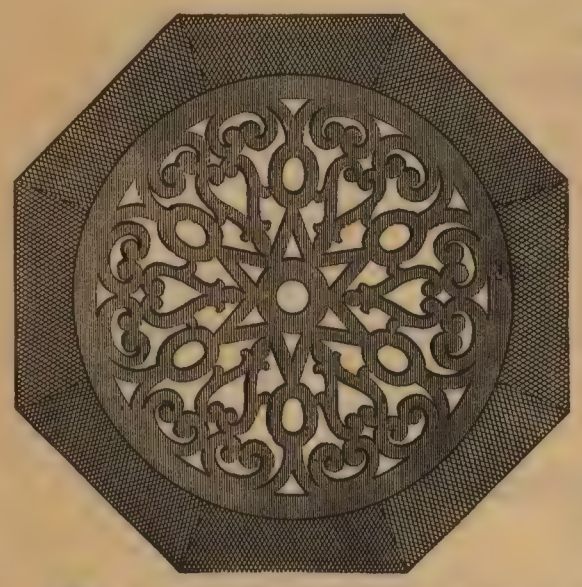
No. 50.

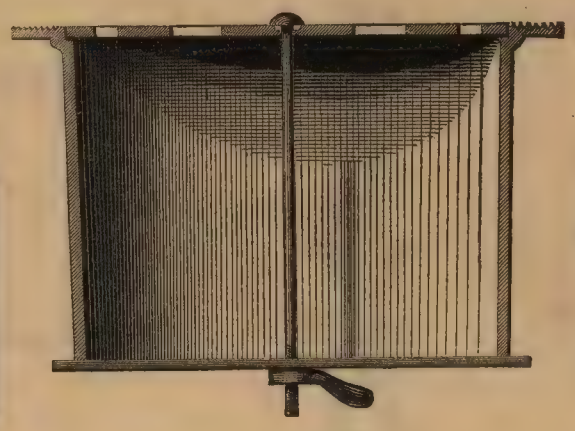


No. 51.

No. 52.

# COAL VAULT RINGS.





SIZES:

| | | | |
|---|---|---|---|
| 18 in. diam. | 13 in. deep | 21 in. diam. | 13 in. deep |
| 18 " | 8 " | 21 " | 8 " |
| 21 " | 18 " | 24 " | 18 " |

ILLUMINATED COVERS.

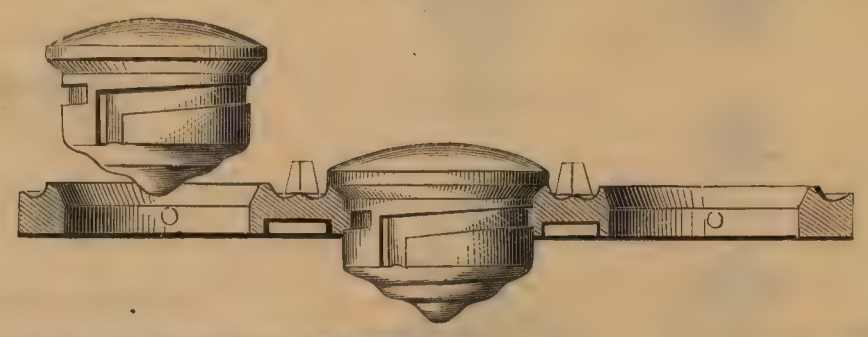
FOR COAL VAULT RINGS.

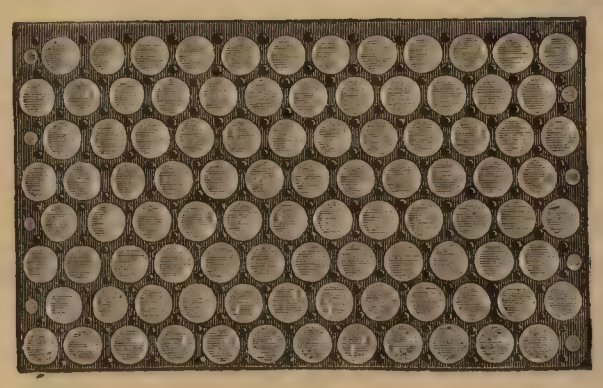
# ILLUMINATING TILING.

**Spout Guard.**

SIZES:

3 in. diam. by 4 ft.
3½ " " " 4 "
4 " " " 4 "
4 " " " 5 "
4 " " " 6 "
5 " " " 5 "
Any diam. by any length.





Cement Tiling,
Concrete Tiling.

Lead Band Tiling,
Rubber Band Tiling.

We make any and all kinds of Illuminating Tiling.

# FURNACE BARS.

9, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36 to 48 inches in stock. Any length to order.

# FLUE RINGS.

Five, six, seven and eight inches in diameter.

**Sash Weights.**

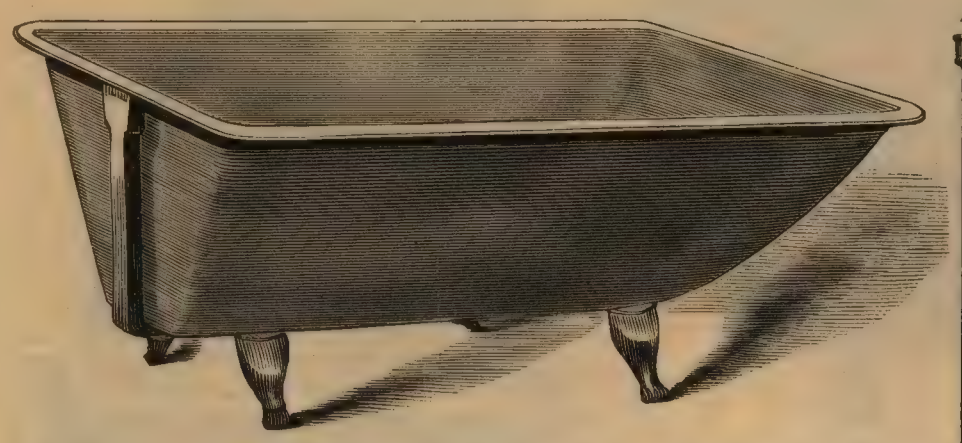
A large stock of Best Hemp Sash Cord always on hand.

# SPOUT PANS.

SIZES.

No. 1, 21½ by 13½ inches.
No. 2, 25 by 14 inches.
No. 3, 27 by 17 inches.

# CAST IRON BATH TUBS.

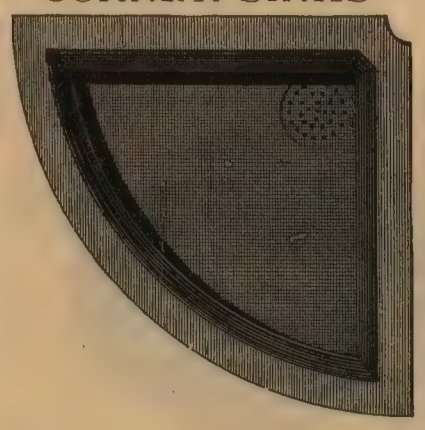


WE make two sizes—6 feet and 5 feet 6 inches long—as shown above. The cleanest, neatest and most economical Tub ever used. Made in one piece, impossible for them to leak, and can be furnished at one-half the price of any other Tub of respectable finish. It requires no boxing in, thereby preventing bugs and roaches from harboring around it. It is emphatically the MODERN TUB. Its merits have heretofore been little known, but it is now rapidly assuming its proper position as the best Tub made. We call the attention of architects and builders to this article in particular, as promoting the best interest of their patrons. For institutions and public bath houses they have no equal. We furnish them, all painted and ready for use, with couplings and bolts to fasten the Waste Pipe. Any one can attach the Waste Pipe to the Tub.

# DRAIN PIPE.

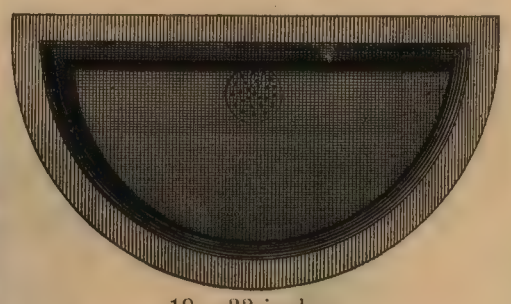
We manufacture Cast Iron Drain Pipe of all sizes used. We keep a large quantity, with fittings, in stock, and are prepared to fill any order on short notice. The superiority of iron over lead or clay pipes is not a matter of experiment, but is a well demonstrated fact. Lead has always to be protected by boxing, to prevent bruising or perforating, and is often gnawed through by rats. Clay decomposes, allows the smell to pass through the pores, and is easily broken. Iron pipe is free from all these objections, is much cheaper, and is rapidly coming into general use, both for inside soil pipe and underground drain.

## CORNER SINKS.



22 x 22 inches, 16½ x 16½ inches.

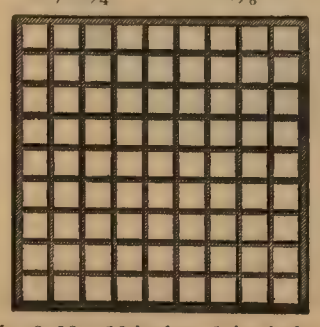
## HALF CIRCLE SINK.



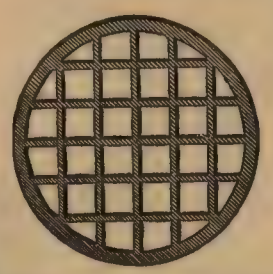
19 x 33 inches.

# DRAIN GRATES.

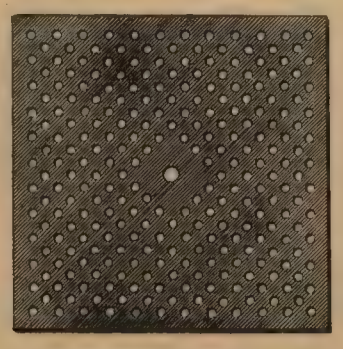
No. 18, 11½ in. diam., 1½ space.
" 19, 11¾ " 1½ "
" 30, 20¼ " 1½ "
" 31, 17½ " 2 "
" 33, 9½ " 1⅛ "
" 17, 14¼ " 1⅞ "



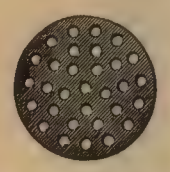
No. 6, 12 x 12 inches, 1 in. holes.
" 9, 8¾ x 8⅝ " ¾ "



No. 20, 9½ in. diam., 1½ in. hole.
" 21, 8¼ " ⅞ "
" 22, 7¾ " 1 "

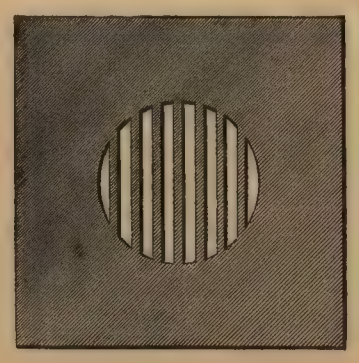


No. 5, 13 x 13 ins., ⅜ in. holes.
" 10, 7½ x 7½ ins., ⅜ in. hole.



No. 23, 5¾ inch diameter.
" 24, 5½ "
" 25, 3¾ "
" 32, 14½ "
All ½ inch holes.

BOX DRAIN GRATE.

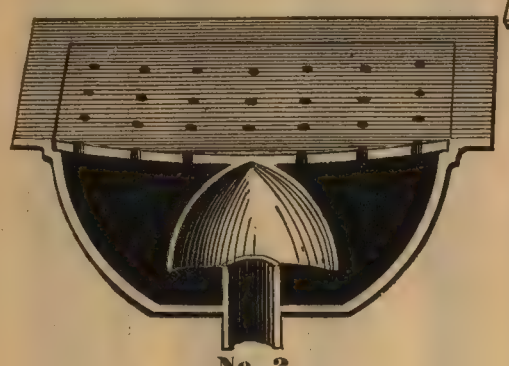


13¼x13½ in. Grating 5½ in. diam.

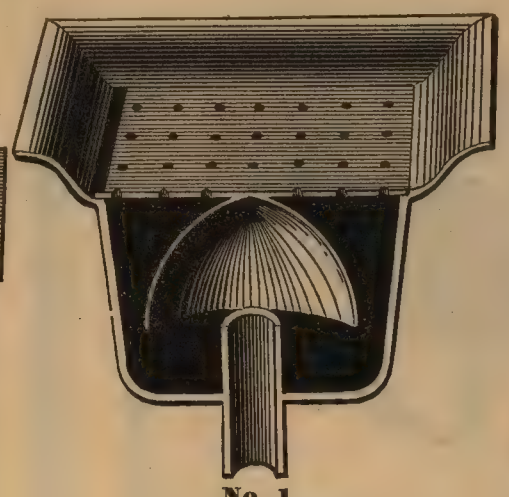
No. 4, 12 by 16 inches, ⅝ inch space.
" 7, 10 by 10 " ⅜ "
" 8, 8½ by 11 " ½ "
" 11, 7½ by 9¼ " ⅜ "
" 12, 4½ by 9 " ½ "
" 13, 4 by 16 " ⅜ "
" 14, 6 by 6 " ⅜ "
" 15, 4 by 6 " ½ "
" 16, 4¾ by 4¾ " ¼ "
" 27, 6 by 18¼ " ⅜ "
" 28, 6 by 12¼ "
" 29, 18 by 24 " ⅞ inch space.

PRIVY GRATES.

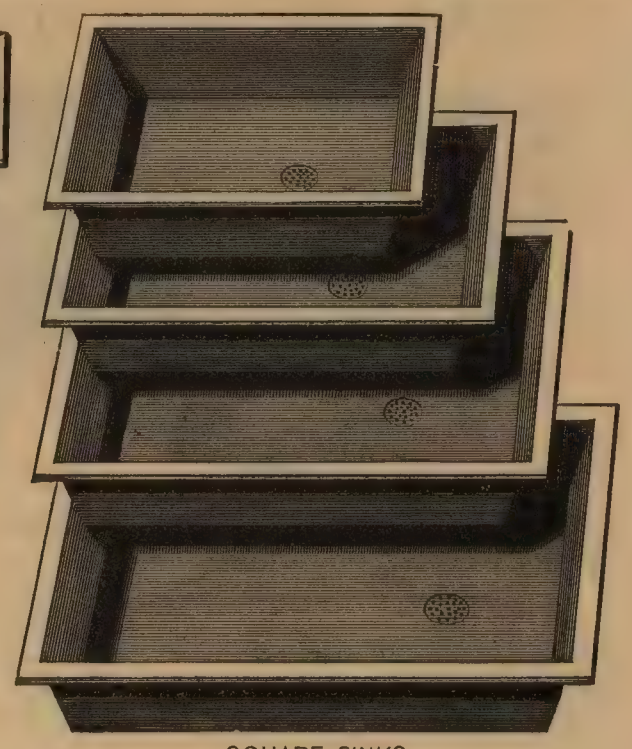
No. 1, 17¾ by 30 inches, 2 inches space.
" 2, 15 by 20 " 2 "
" 3, 15 by 15 " 1½ "



**No. 2.**
BELL TRAP.
13 inches by 13 inches.



**No. 1.**
BELL TRAP.
12½ inches by 12½ inches.
17½ inches by 17½ inches.



SQUARE SINKS.

| | |
|---|---|
| 24 x 72 in. x 7 in. deep. | 18 x 36 in. x 6 in. deep. |
| 22 x 60 in. x 7 " | 18 x 32 in. x 6 " |
| 22 x 48 in. x 6 " | 18 x 29 in. x 5 " |
| 22 x 41 in. x 6 " | 15 x 29 in. x 5 " |
| 21 x 36 in. x 6 " | 15 x 25 in. x 5 " |

FRENCH HOPPER.

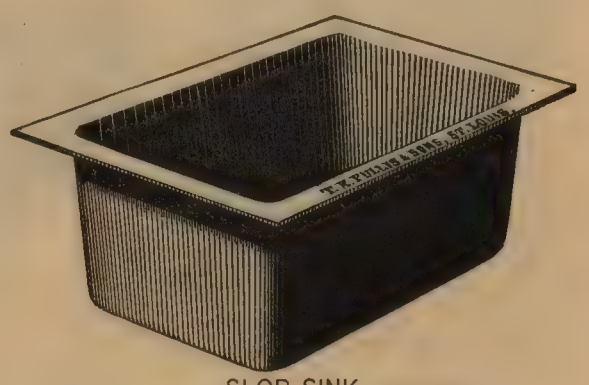
PHILADELPHIA HOPPER.

**No. 2.** **No. 1.**
STOP COCK BOXES.

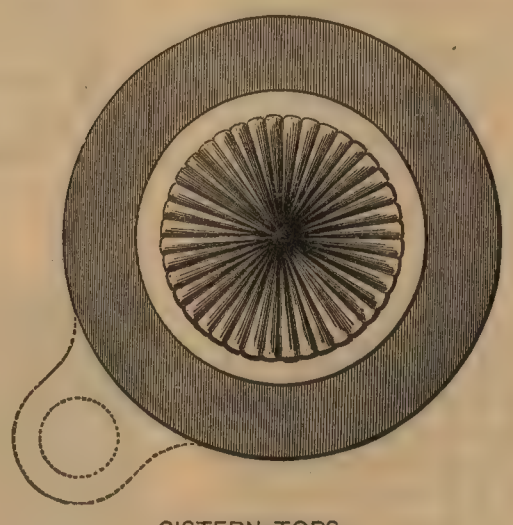
The above represents our improved Stop-cock Boxes for gas and water, with our patent top attached. No. 1 is adapted to gas, and is arranged so that the lower half of the box rests over the cock of the supply pipe, while the upper half telescopes over the lower half, adapting itself to the different depths the supply pipe may be put in the ground. The patent top is hinged to the main part of the box, thus avoiding the possibility of being misplaced or lost.

No. 2 is constructed on the same principle, but is used on supply pipes for water. The gas and water companies in all the large cities are using this style of box.

No. 1 can be extended from 20 inches to 38 inches; bottoms 5½ inches diameter for 1¾ inches pipe, and 4 inches diameter for 1½ inches pipe. No. 2 can be extended from 3 feet 3 inches to 4 feet 3 inches; bottom adapted to usual size of water supply pipe.



SLOP SINK.
16½ inches by 20½ inches by 10 inches deep.



CISTERN TOPS.

18 inch opening. 21 inch opening.

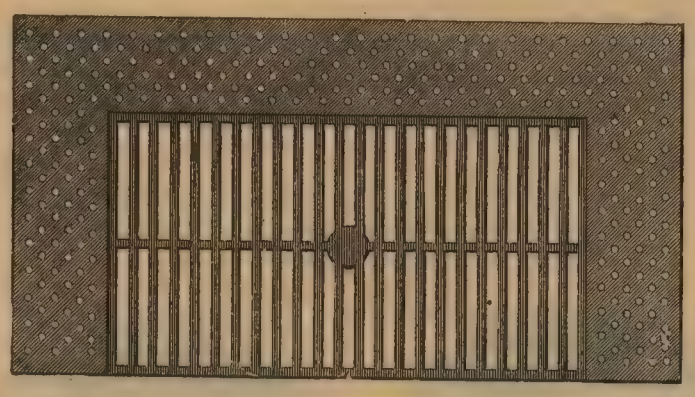
These Cistern Tops have the covers fastened to the rim with lugs in such a manner that children cannot remove the cover.

BOILER STAND

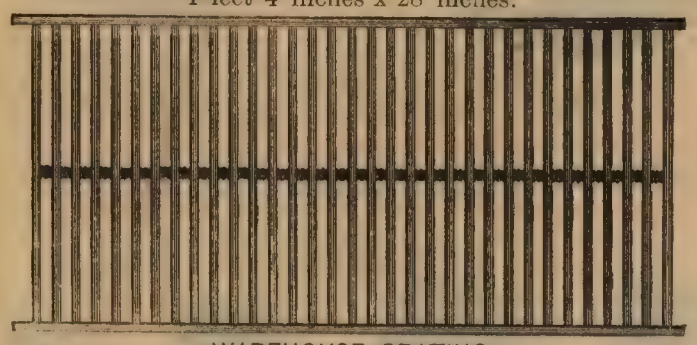
# CAST IRON AREA GRATINGS.



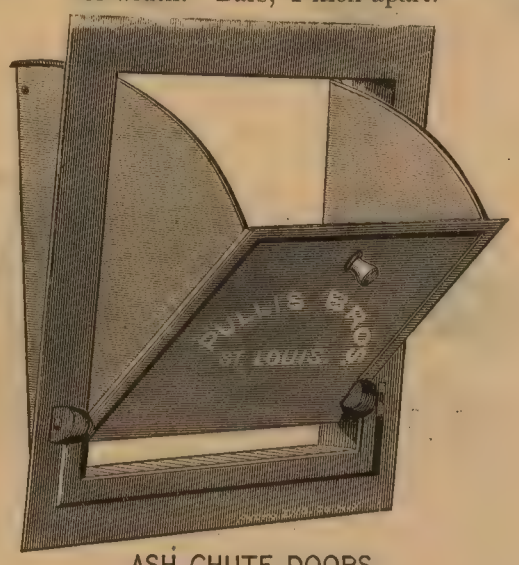
These Gratings do away with stone or wood coping around areas. The Gratings can be cast solid to the coping, or separate as desired.



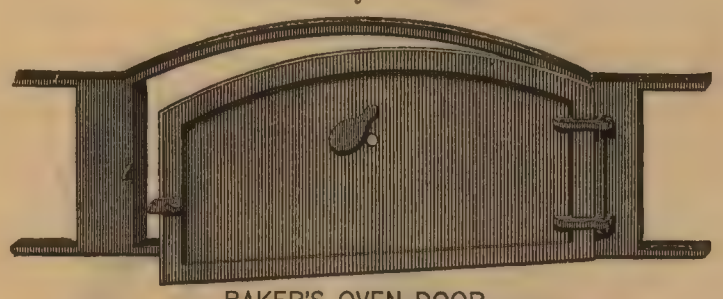
*No. 1.*
4 feet 4 inches x 28 inches.



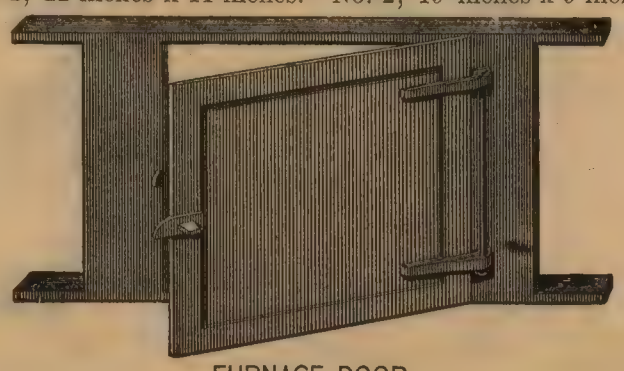
WAREHOUSE GRATING.
Usual size of iron used, 1½ x ½ or 1½ x ⅜. Made any length or width. Bars, 1 inch apart.



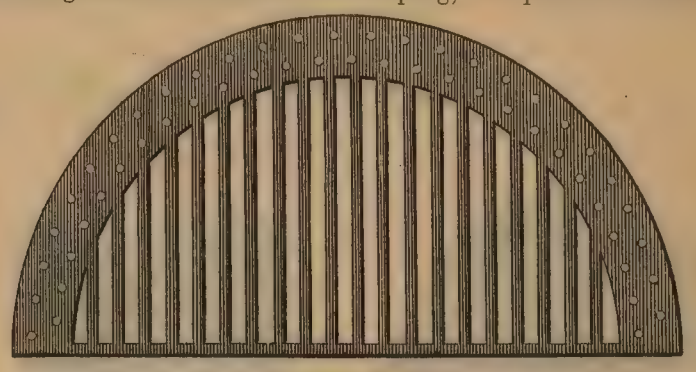

ASH CHUTE DOORS.
15 inches by 15 inches.



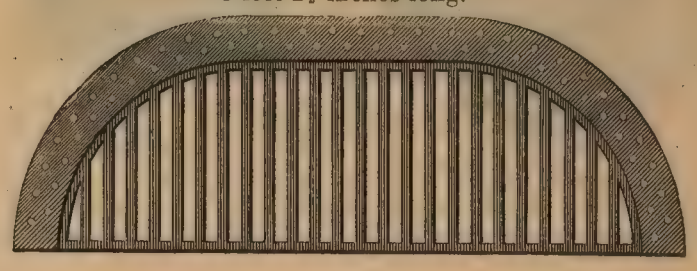
BAKER'S OVEN DOOR.
SIZES OF OPENING.
No. 1, 22 inches x 11 inches. No. 2, 19 inches x 9 inches.



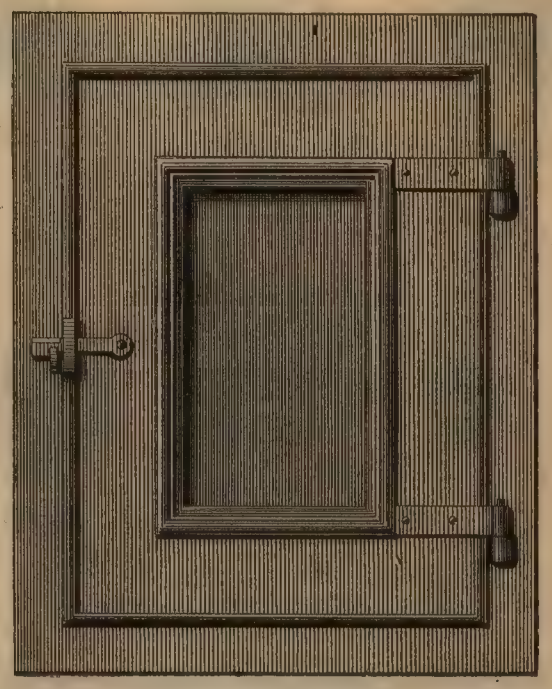
FURNACE DOOR.
SIZES OF OPENING.
No. 1, 12 inches x 10 inches. No. 3, 20 inches x 20 inches.
" 2, 16 " x 11 " " 4, 8 " x 10 "



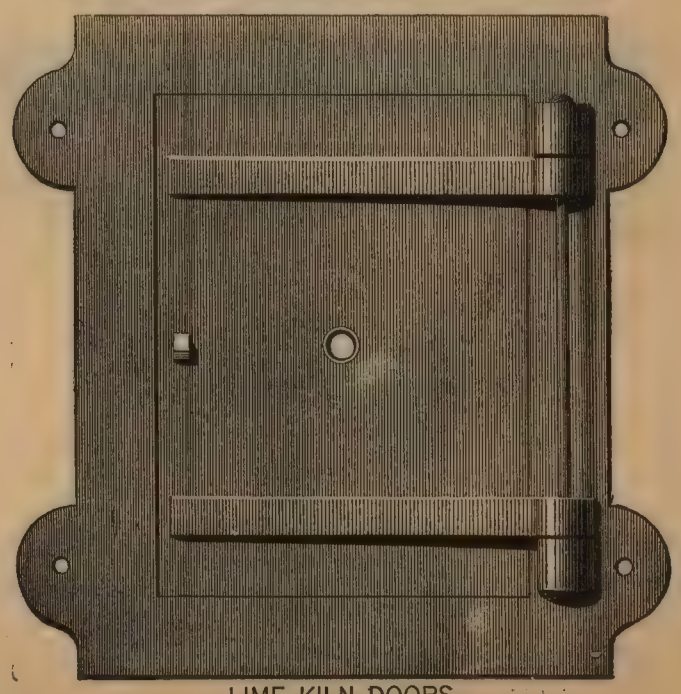
*No. 2.*
3 feet 2½ inches long.



*No. 3.*
3 feet 9½ inches x 16 inches.



ASH PIT DOOR.
SIZE OF OPENING.
22 in. x 18 in. 27 in. x 18 in. 16 in. x 12 in.



LIME KILN DOORS.
Size of opening, 12½ inches x 18 inches.

# CORNICE ROSETTES.

№1.

№2.

№3

№4.

№5.

№6.

№7.

№8.

№9.

№10.

№11.

№12.

№13.

№14.

№15.

№16.

№17.

№18.

№19.

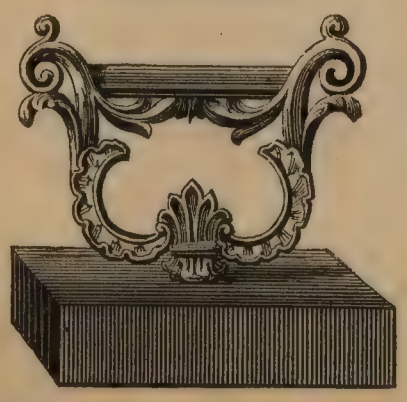
## STEP PLATES.

**Heel Step Plate.**

**Nosing Step Plate.**

We keep in stock the following sizes, both Nosing and Heel Strips: 2 feet, 2 feet 6 inches, 3 feet, 3 feet 6 inches, and 4 feet; other lengths to order.

## FOOT SCRAPER.



Screwed to Wood; Leaded into Stone, or with box attached; to build in brick paving.

## STAIR RAIL BRACKET.

Is adjustable to any bevel of hand rail desired.

## COUNTER-RAIL BRACKETS.

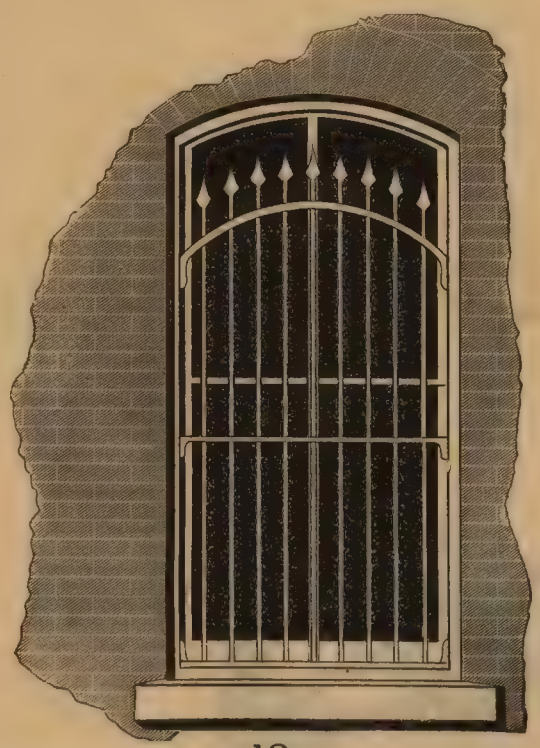
№1.

№2.

№3.

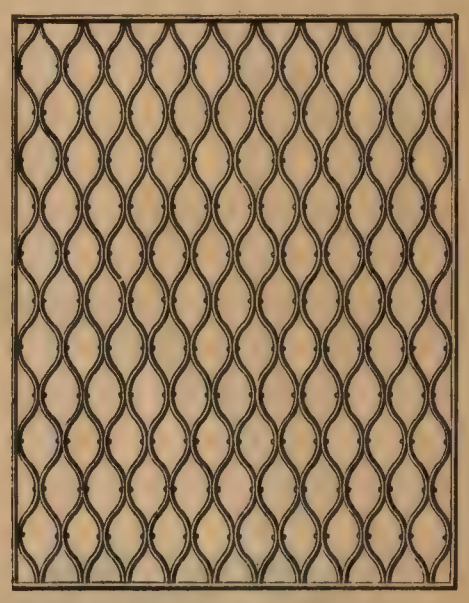
№4.

# WINDOW GUARDS.



13

12.



14.

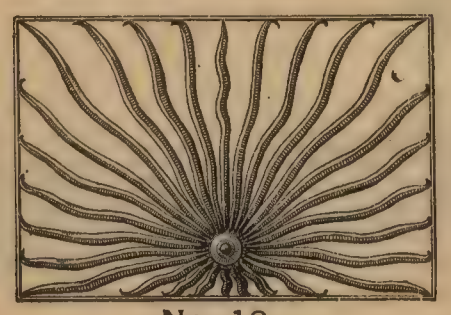
7.
17¾ inches high.

6.
14 inches high.

10.
16 inches high.

15.

1.
17¼ inches high.



No. 18.

16.

8.
18¾ inches high.

17.

4.
23 inches high.

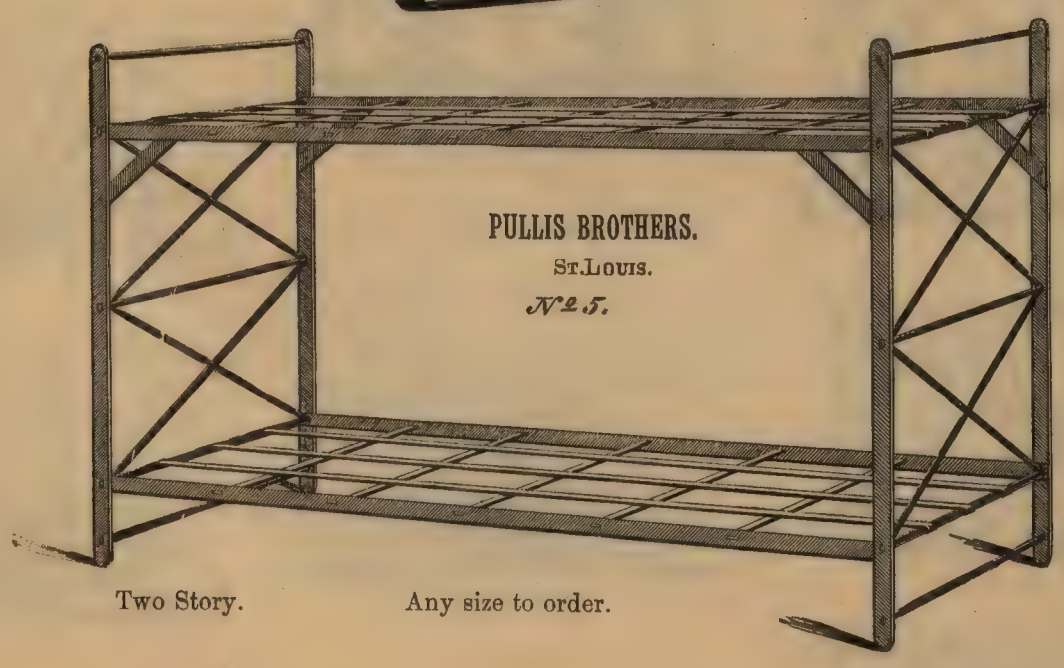
No. 19.

11.
15¾ inches high.

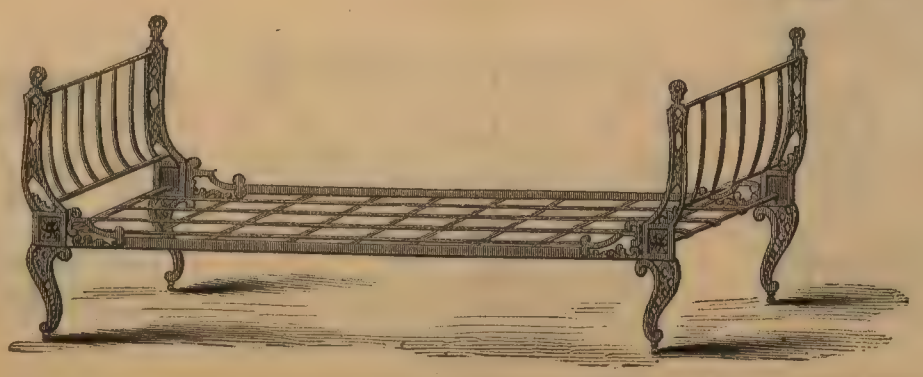
Window Guards of any design, shape or size, of cast or wrought iron.

# IRON BEDSTEADS

No. 1, 6 ft. by 4 ft.; 6 ft. 2 by 2 ft. 10.

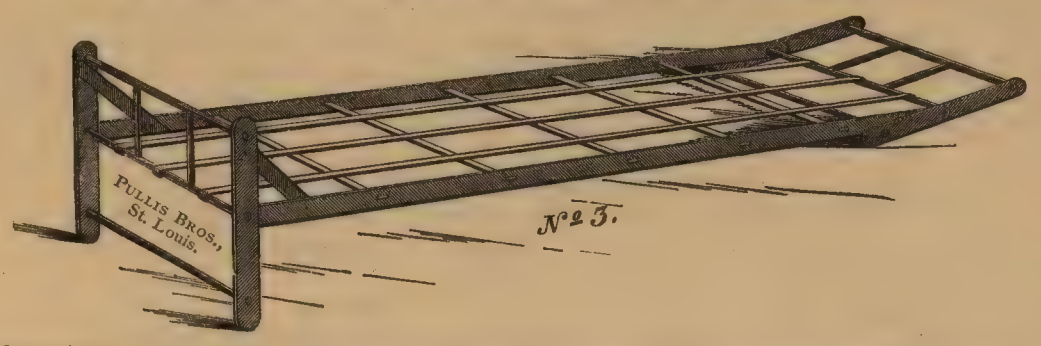



Two Story. Any size to order.



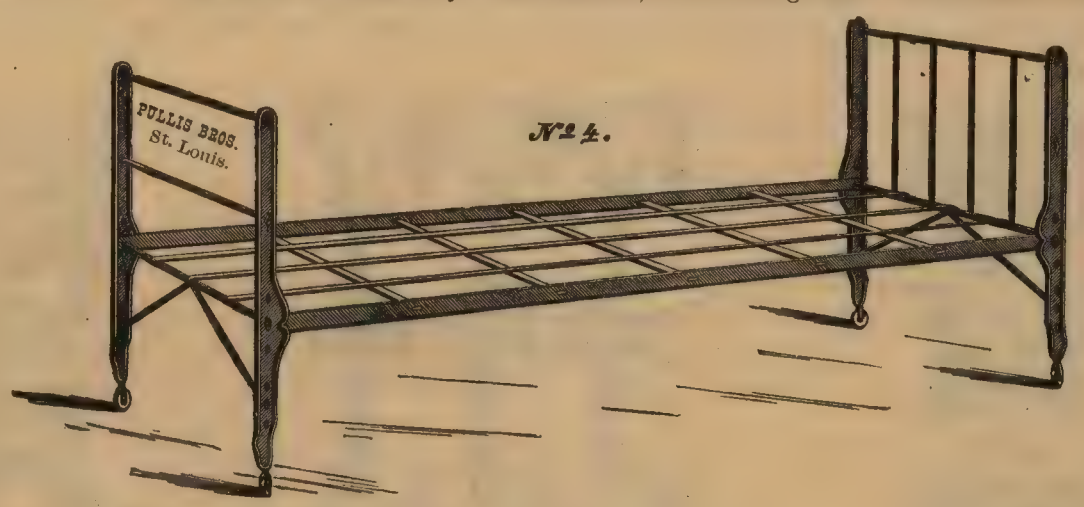
No. 2. 6 feet 2 inches by 2 feet 8 inches; 6 feet 2 inches by 4 feet. Other sizes to order.

# IRON BEDSTEADS.



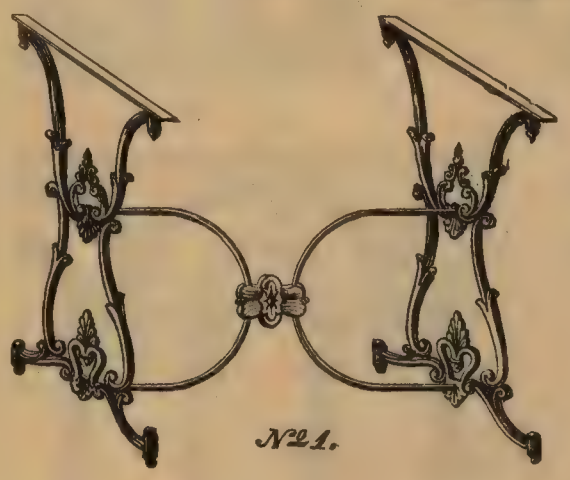

№ 3.

5 feet by 2 feet 4 inches; 6 feet 2 inches by 2 feet 8 inches, with folding ends. Other sizes to order.




№ 4.

# TABLE STANDS.



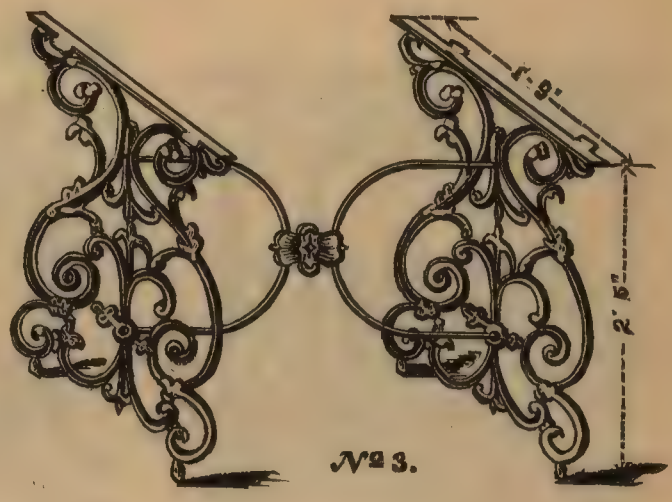
№ 1.

№ 2.

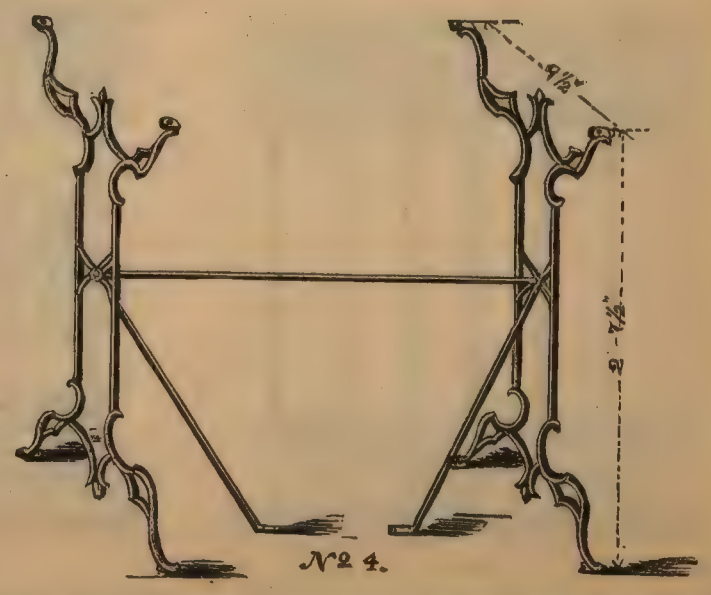
No. 1.
STORE STOOL.



No. 2.
STORE STOOL.




№ 3.




№ 4.

# IRON RAILING.

We invite especial attention to our RAILING DEPARTMENT. This has been a prominent feature in our works since the year 1839, and we now challenge competition with any house in the country for the beauty and variety of our Designs, which now number over one hundred Styles, especially adapted to Public and Private Buildings, Parks, Cemeteries, Banks, Offices, etc. All work of this description not put up by us, is set up and finished in the shop, exactly in the position it will occupy when in its place; it is then carefully numbered. By following this as a rule we have always given satisfaction, as it avoids the possibility of any additional fitting after leaving the shop.

Rails Nos. 4, 47, 8, 11, 13, 24, 5, 6, 12, 17, 51, 20, 52, 32, 33, 35, 36, 38, 34, 40, 55, 45, 46, 26, 41 and 54 are single faced.

Rails Nos. 10, 2, 7, 9, 14, 15, 16, 19, 21, 22, 25, 28, 30, 37, 42, 43, 44, 49 and 50 are double faced.

Rails Nos. 14, 16, 22, 25, 37, 42, 43, 44, 45, 46, 48, 49, 50 and 58 can be made on a rake or incline. If any of the others are wanted on a rake, parties will have to correspond with us for information.

Railing Post No. 4 is especially adapted to Rails Nos. 32, 38 and 40. Posts Nos. 11, 9, 10, 12, 1, 2, 13 and 5 are adapted to Rails 42, 43, 44, 45, 46, 48 and 57, according to the size of iron used in the railing and their heights.

Posts shown in Rails 54 and 41 are included in price of fence; all other posts are extra.

When we are requested to give figures on this class of work, we always take it for granted that the railing is straight and level, unless otherwise stated.

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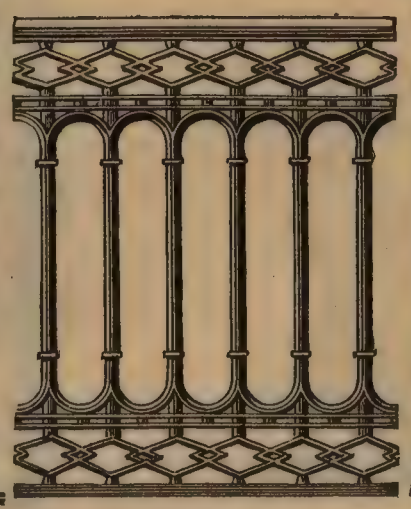

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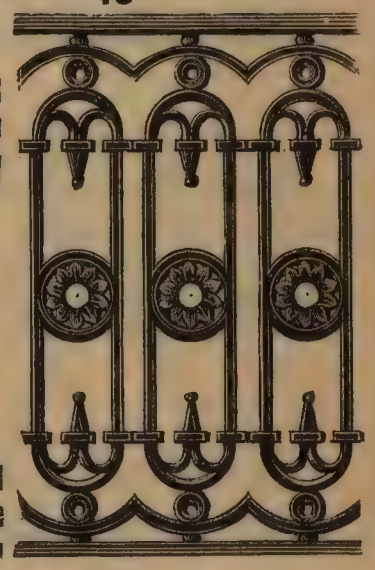

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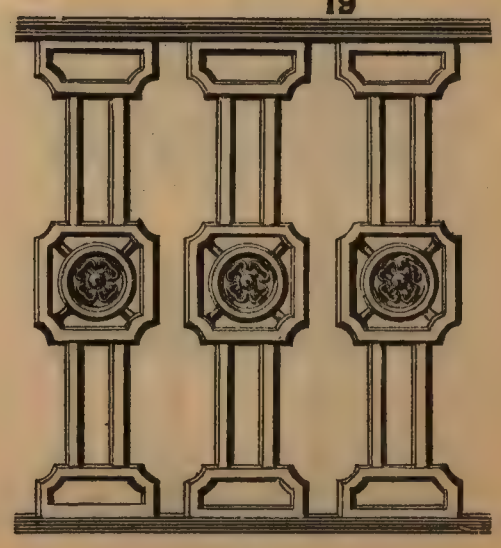

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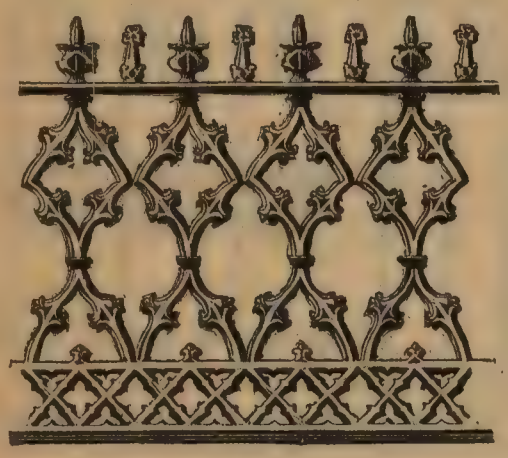

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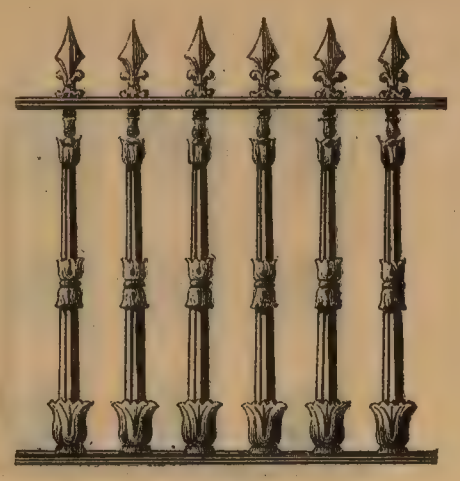

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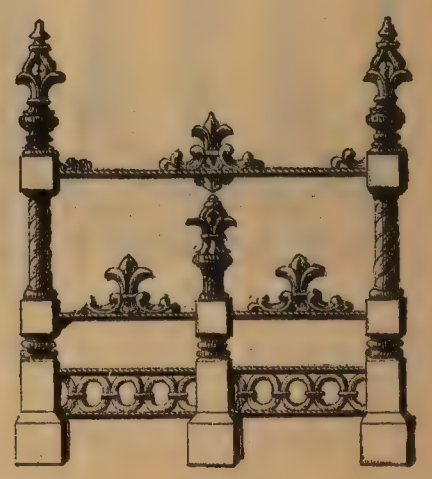

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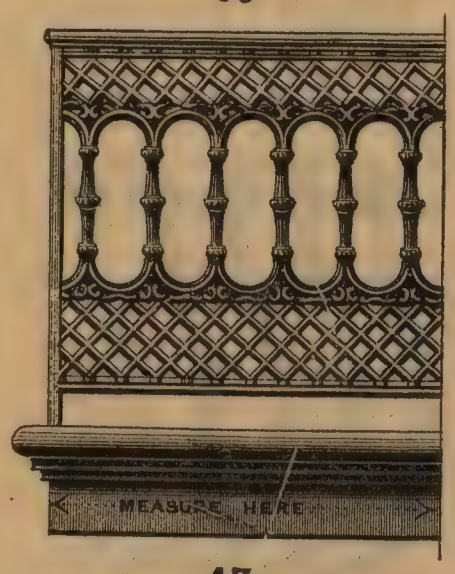


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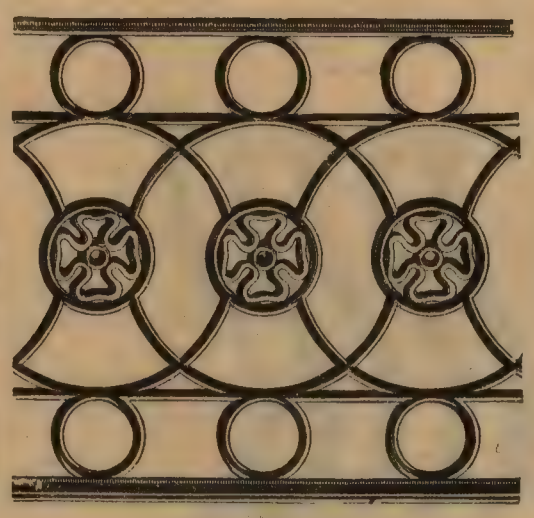

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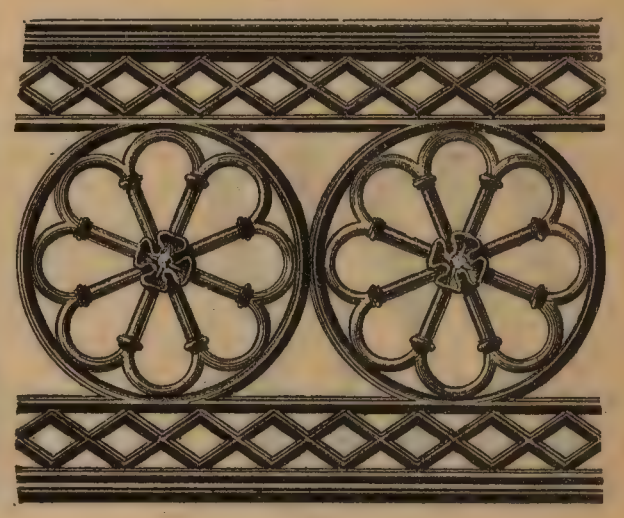

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55

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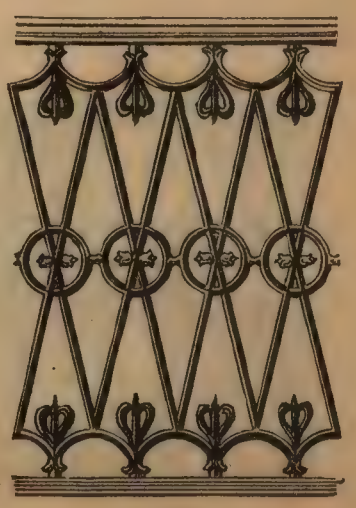

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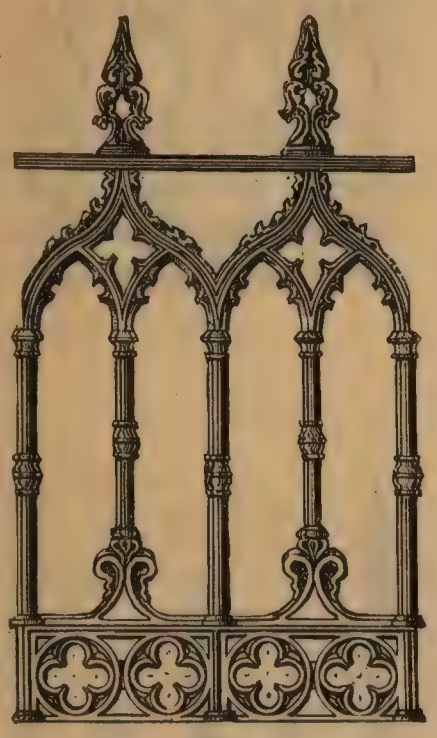

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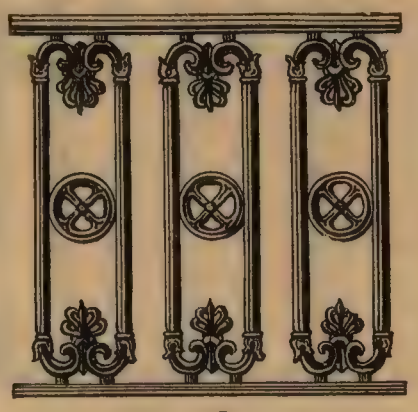

78

80

79

# Opera House Dress Circle Railings.

81

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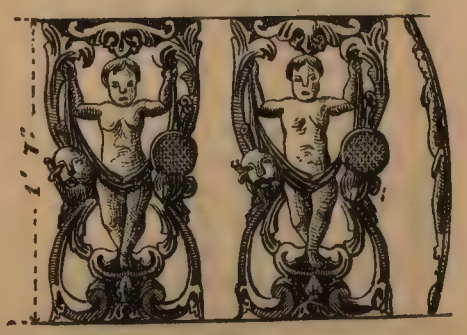
86



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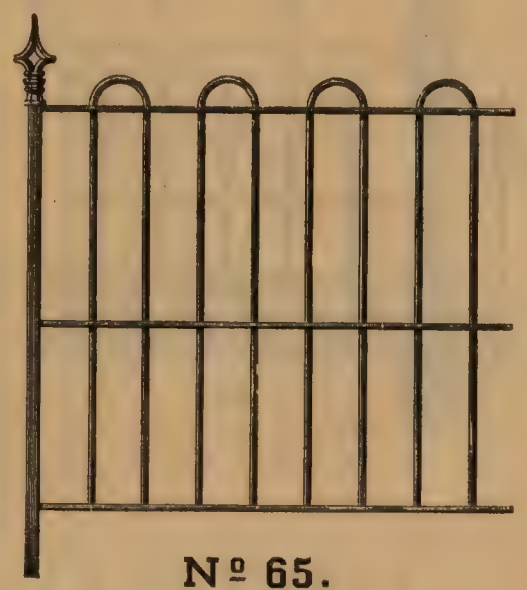

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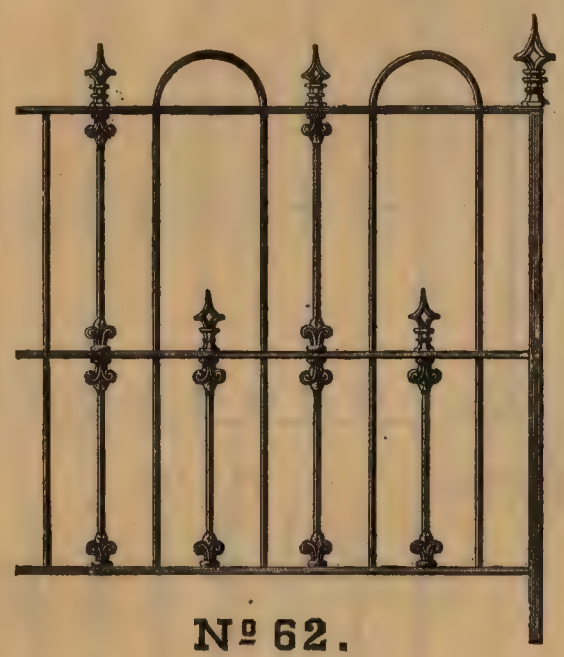

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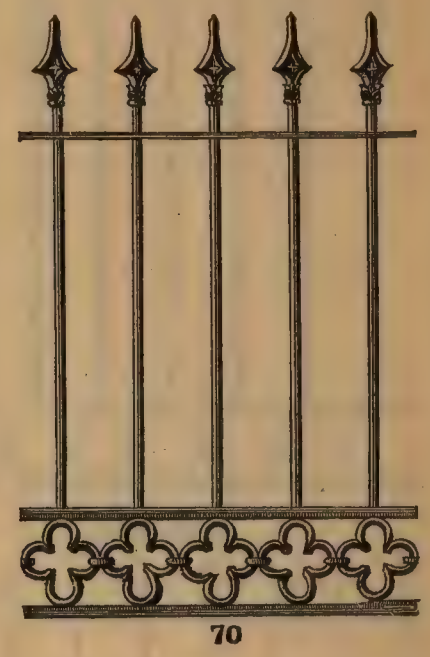

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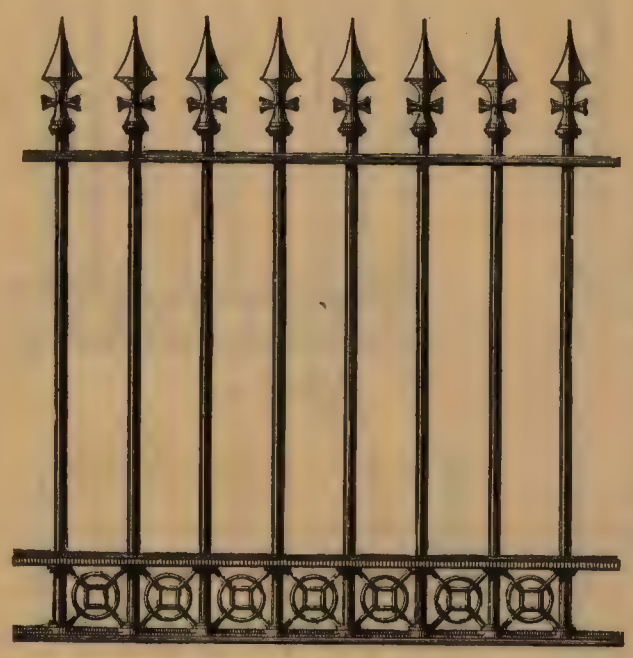

No 57

72

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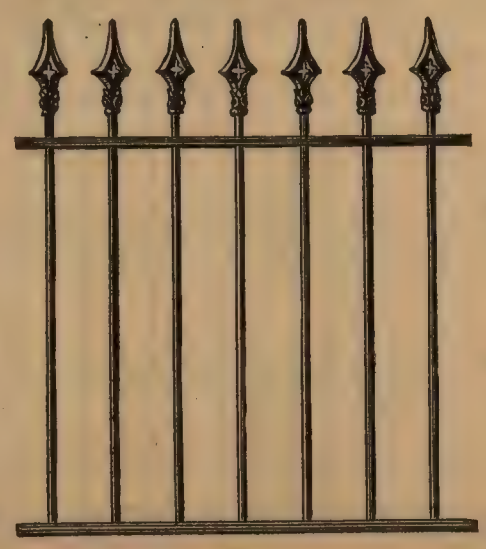
No 43.



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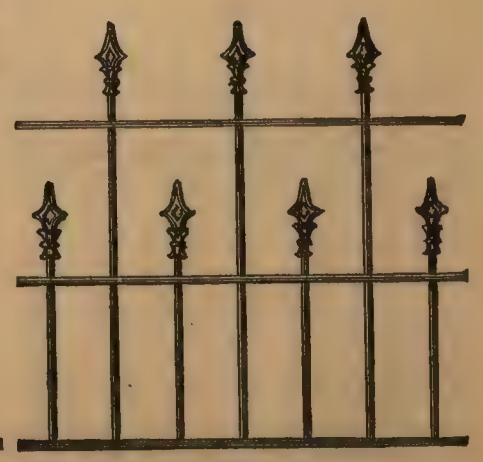

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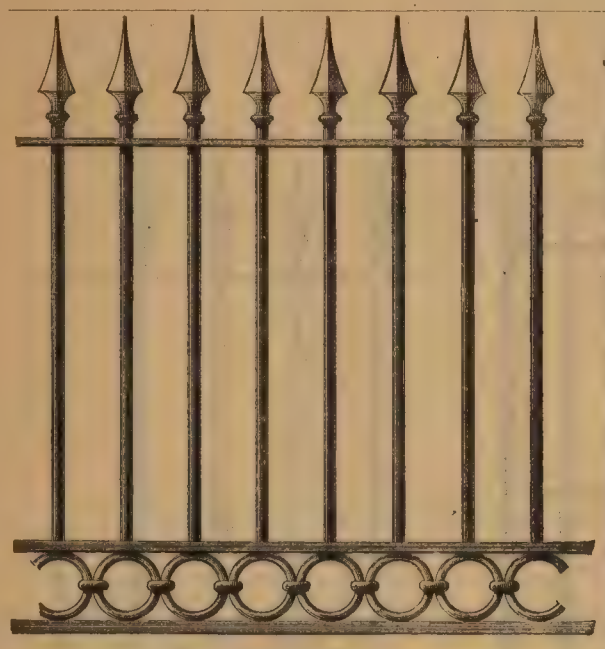

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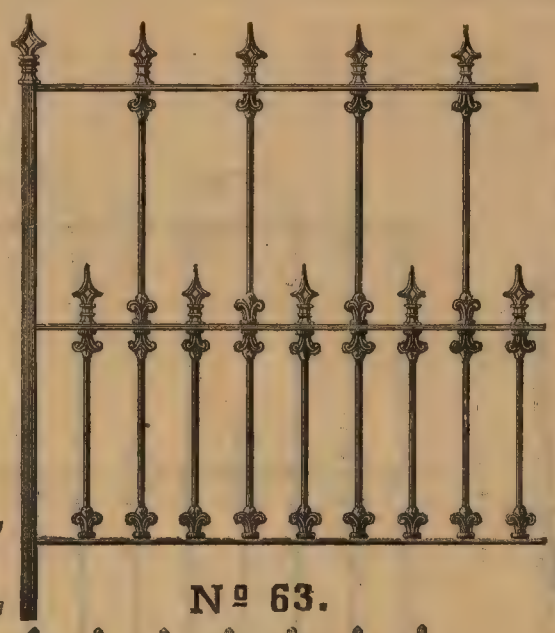

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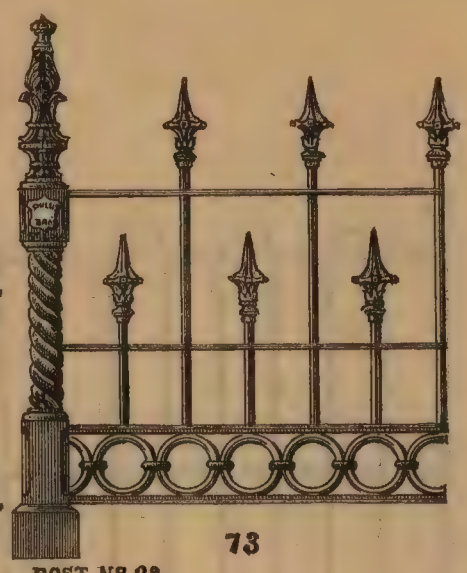
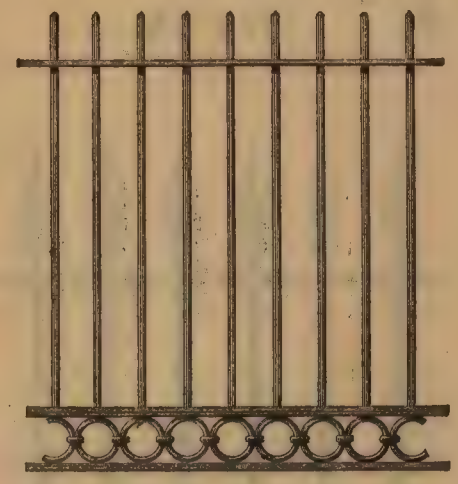


73

POST № 28.

№ 42.

№ 45.



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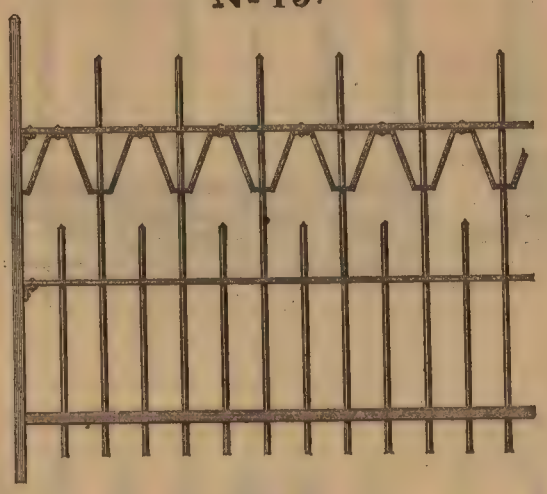
№ 88.



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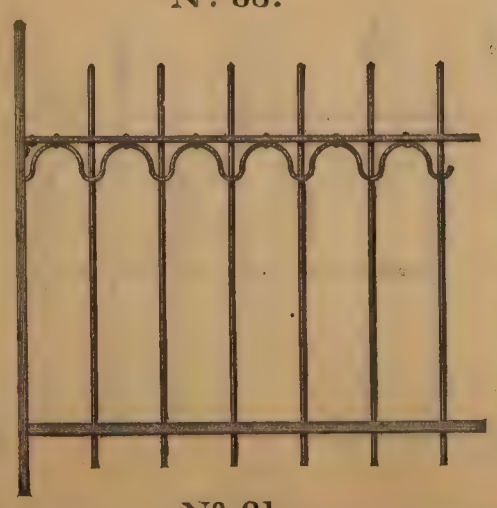

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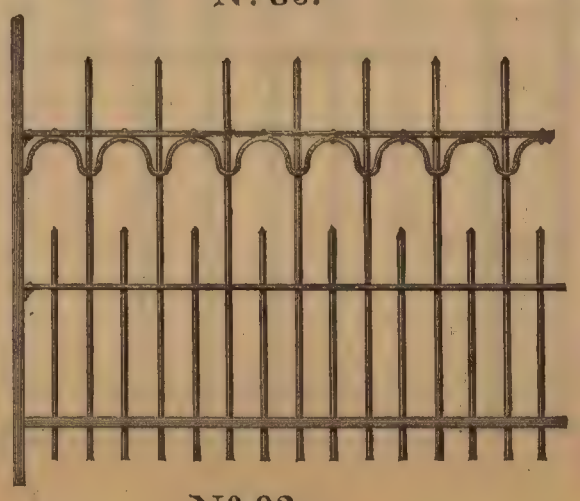

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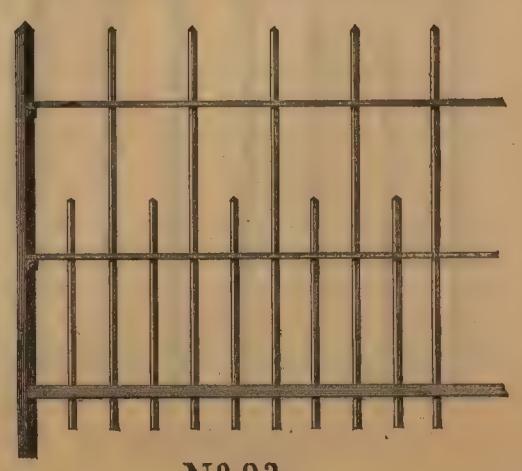

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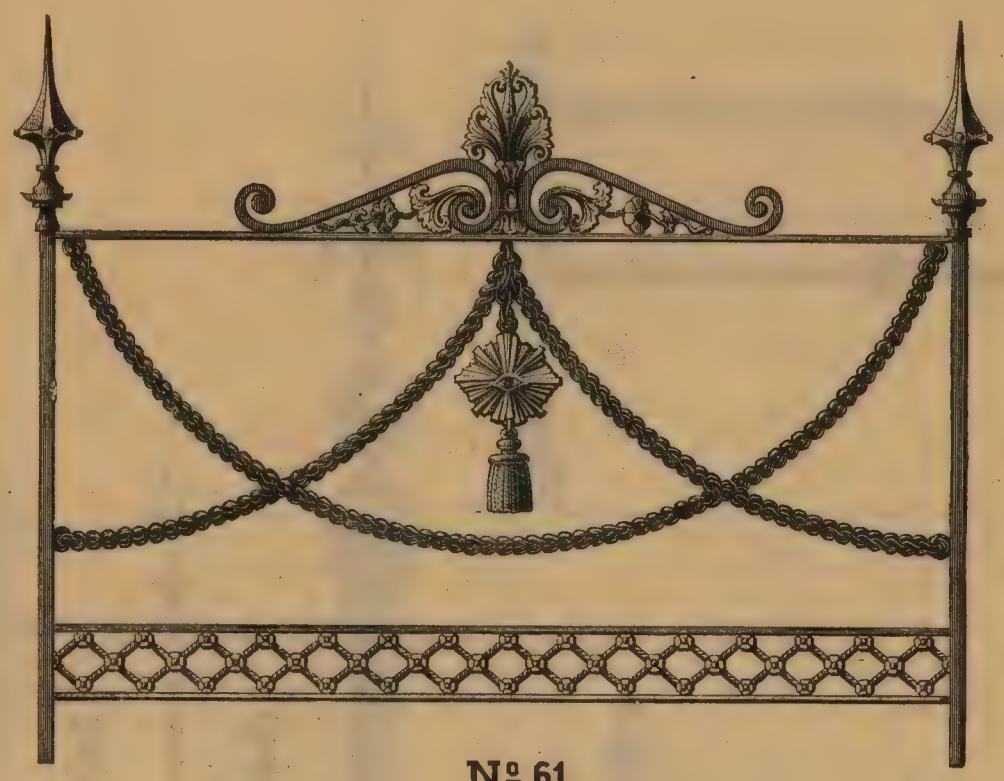
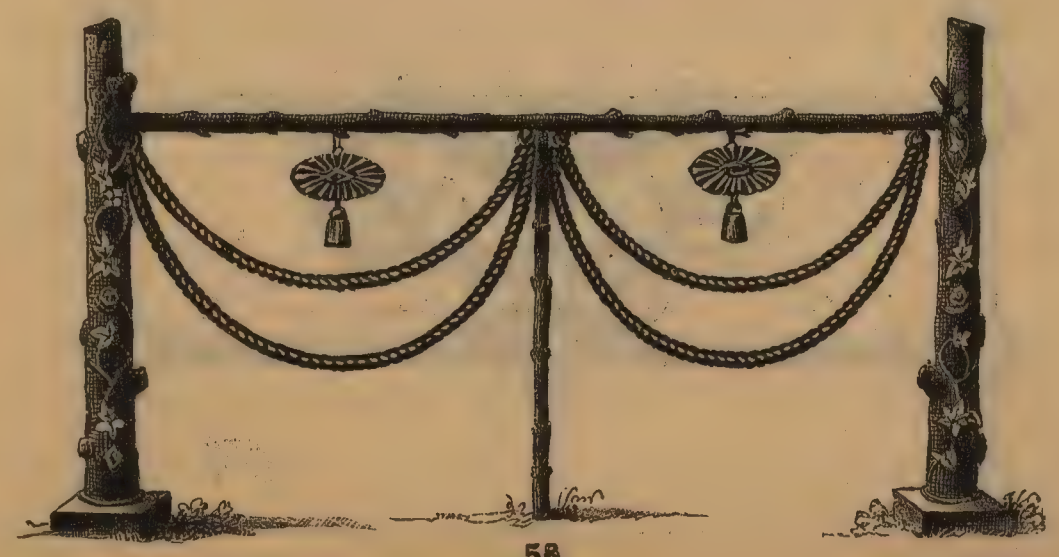


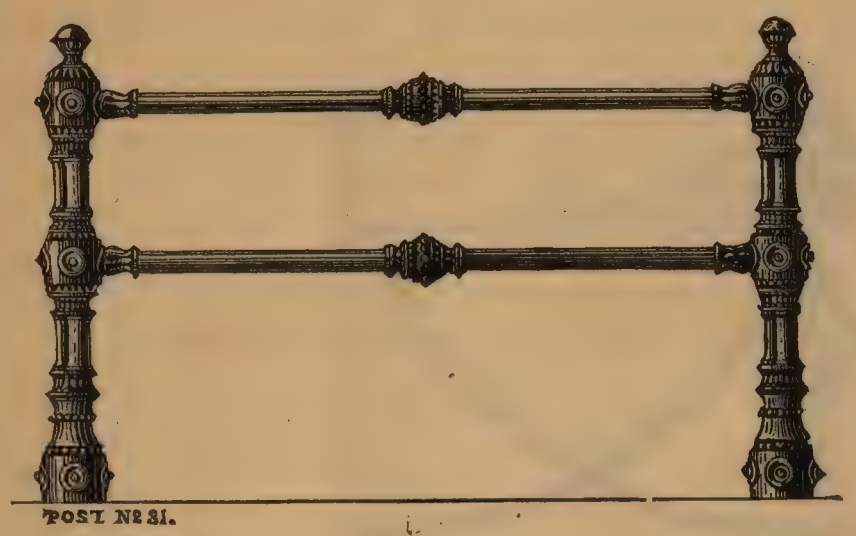
**№ 61.**

49
POSTS 9 FT. APART.

26



58
POSTS 10 FT. APART.

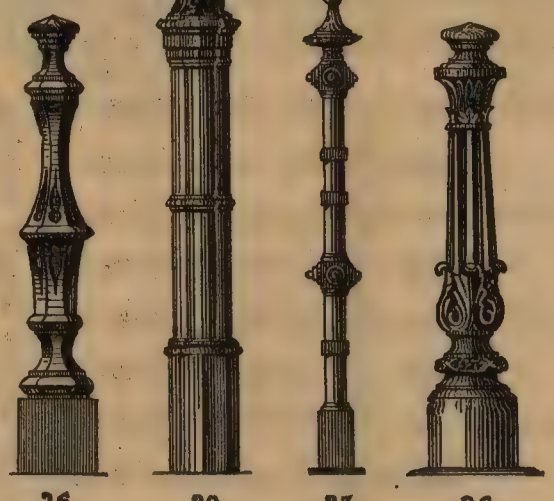


POST No 21.

No 68.

No 64.

No 66.

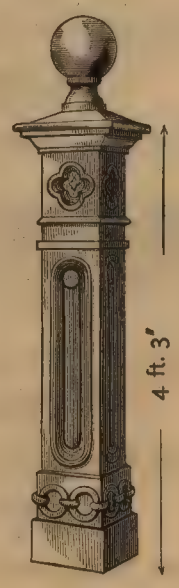


26. 30. 27. 28. 3. 4. 5. 6.

No. 105.

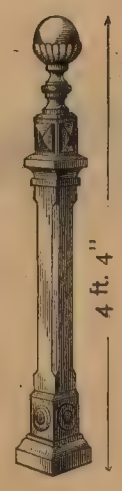
12.

No. 9.



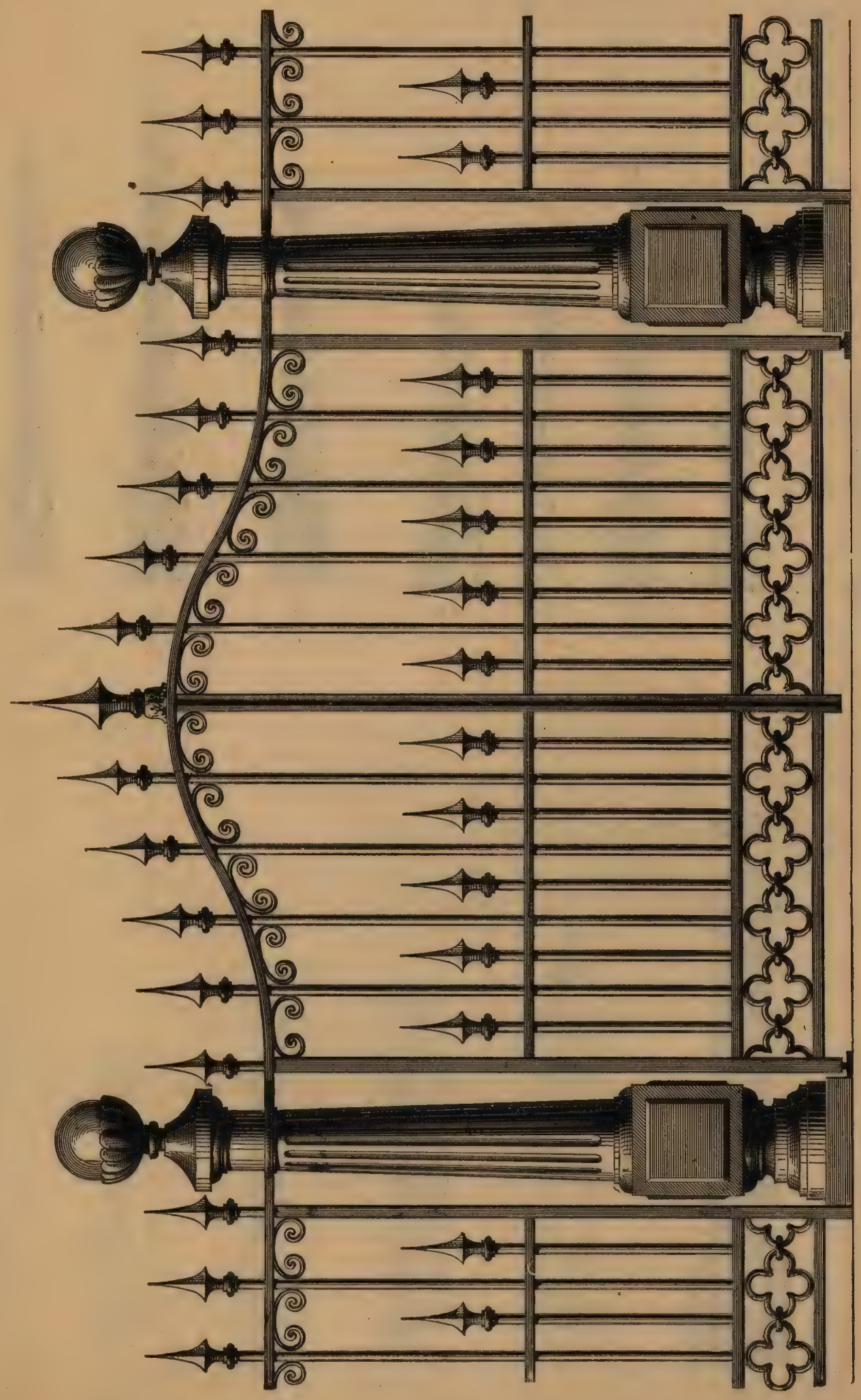
No. 1.

No. 10.

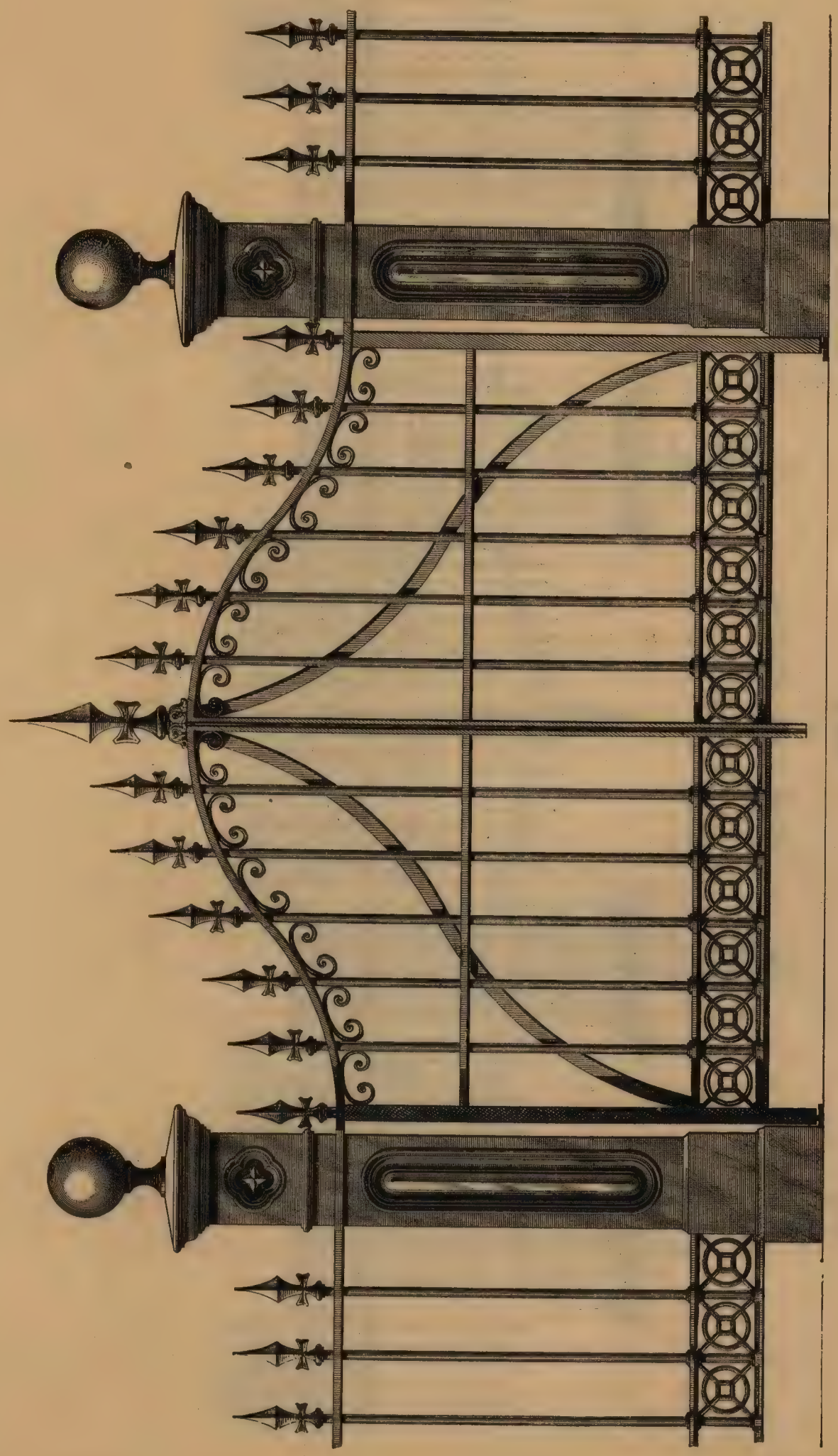


No. 2.

No. 11.



No 1 GATE.



No 2.

GATE.

PULLIS BROS.,

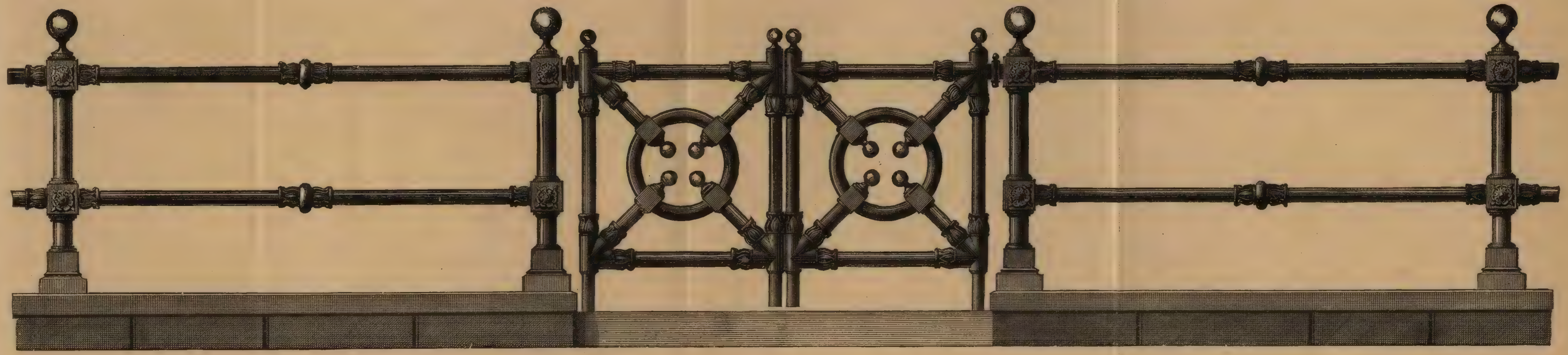
ST. LOUIS.

No 3.

GATE.

**No 54.**

GATE AND RAILING.



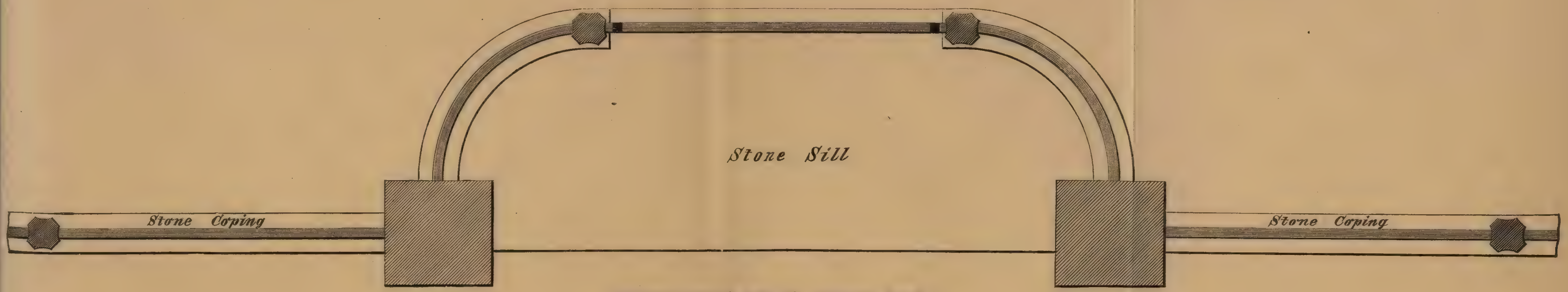
No. 67. GATE AND RAILING.

PULLIS BROTHERS, ST. LOUIS.

PULLIS BROTHERS, ST. LOUIS.

№ 4.

# GATE.




GROUNDPLAN of №4 GATE.

# MANSARD ROOF RAILING.

1

2

3

4

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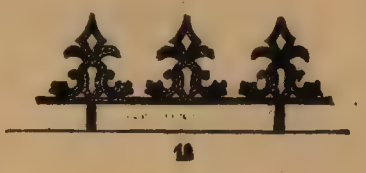
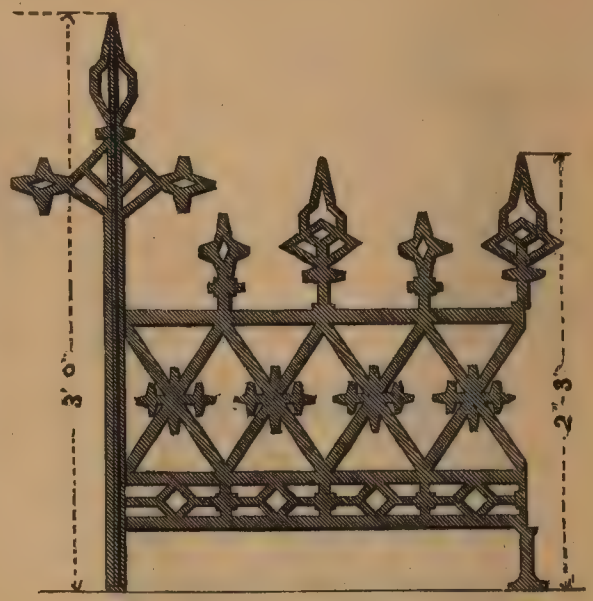
12.



14

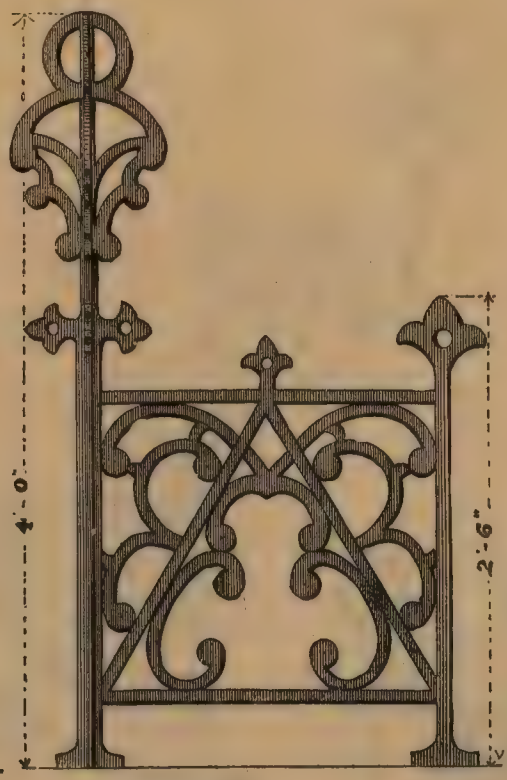
18.

20.




21.

19.

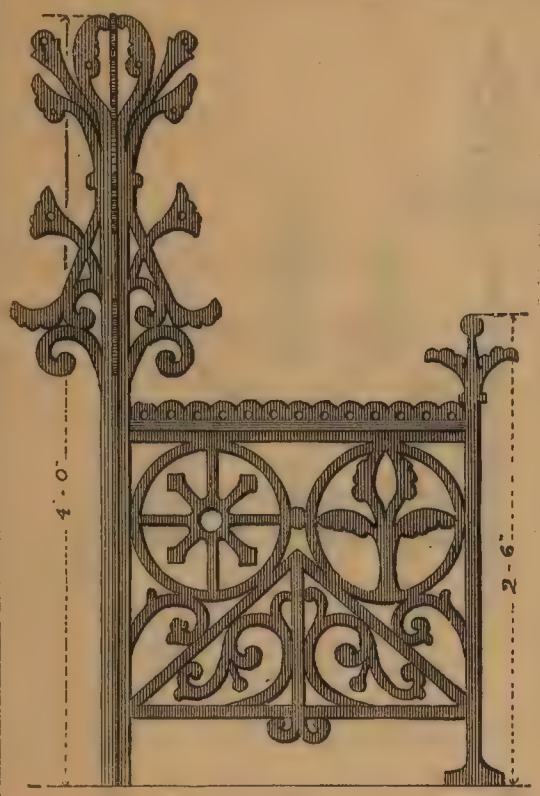



22.

23.

24.

25

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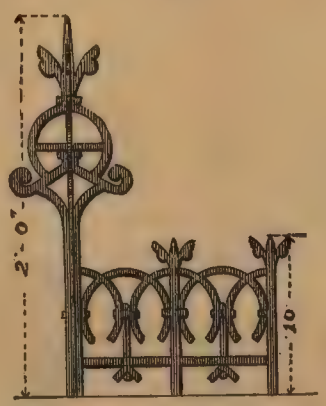


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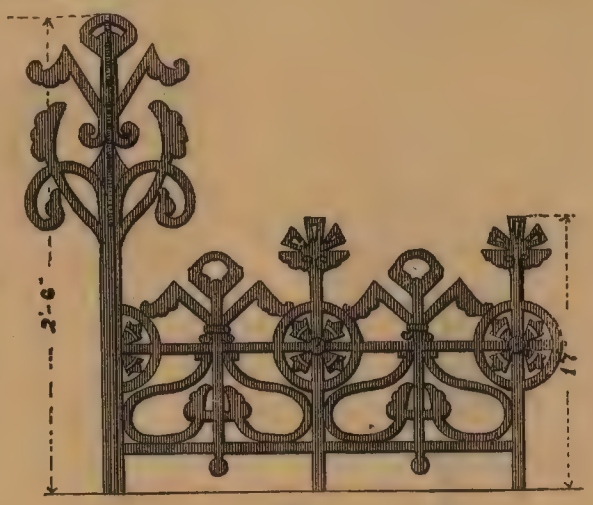


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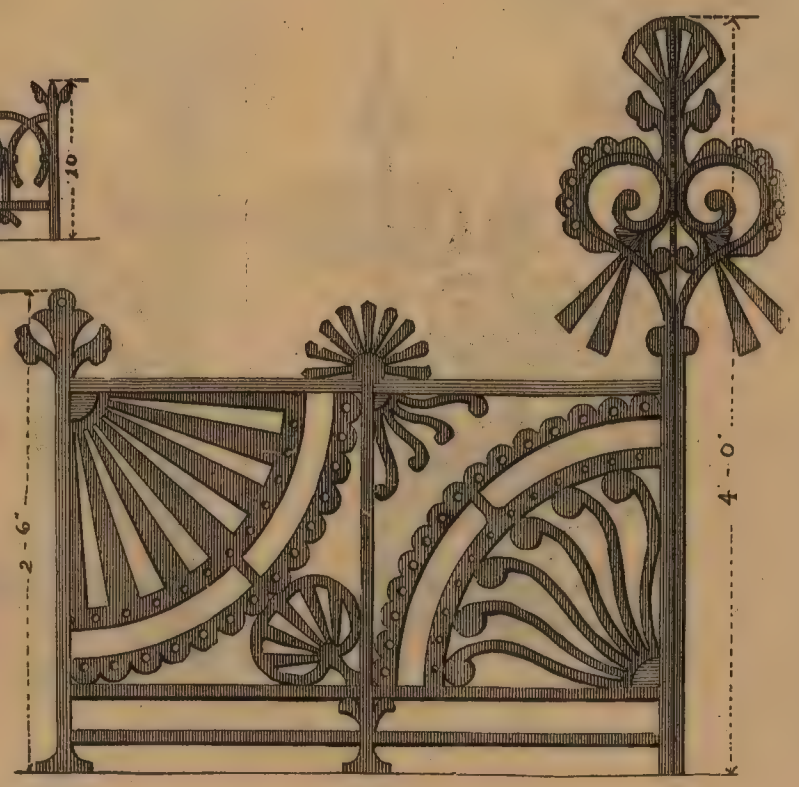


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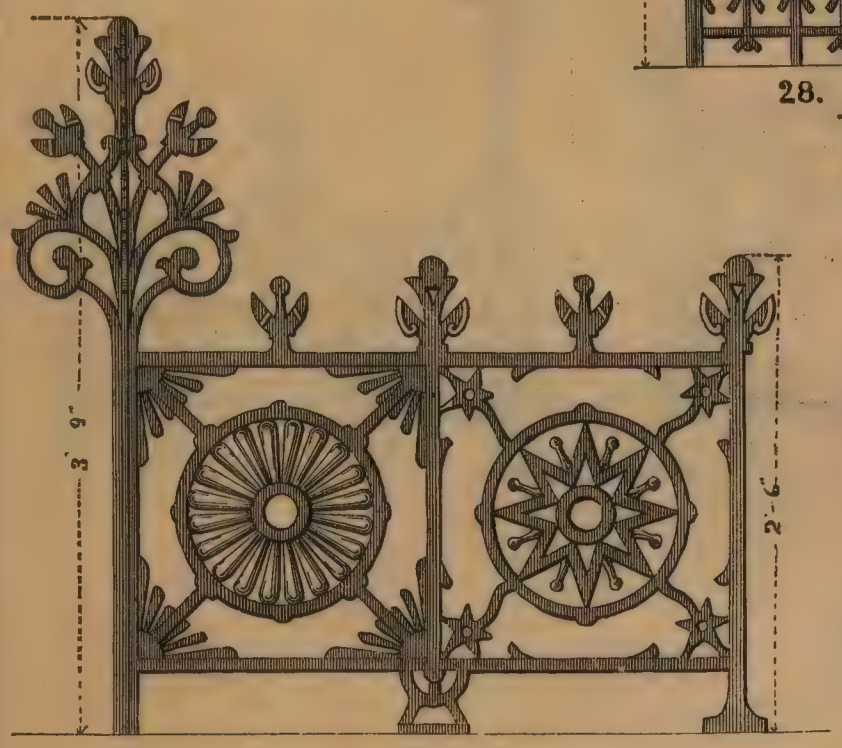


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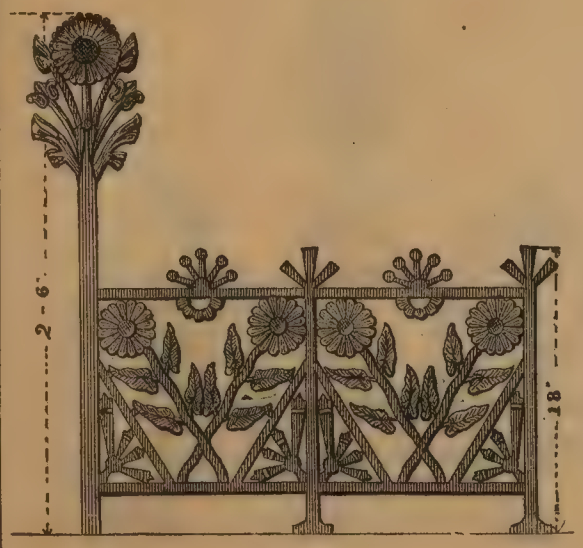



33.

32.

# SETTEES and CHAIRS.

№2.

**FLORAL SETTEE.**
3 feet 10 inches long.

№1.

№2.

№3.

**DOLPHIN SETTEE.**
6 feet 8 inches long.

№1.

**GRAPE VINE SETTEE.**
3 feet 8 inches long.

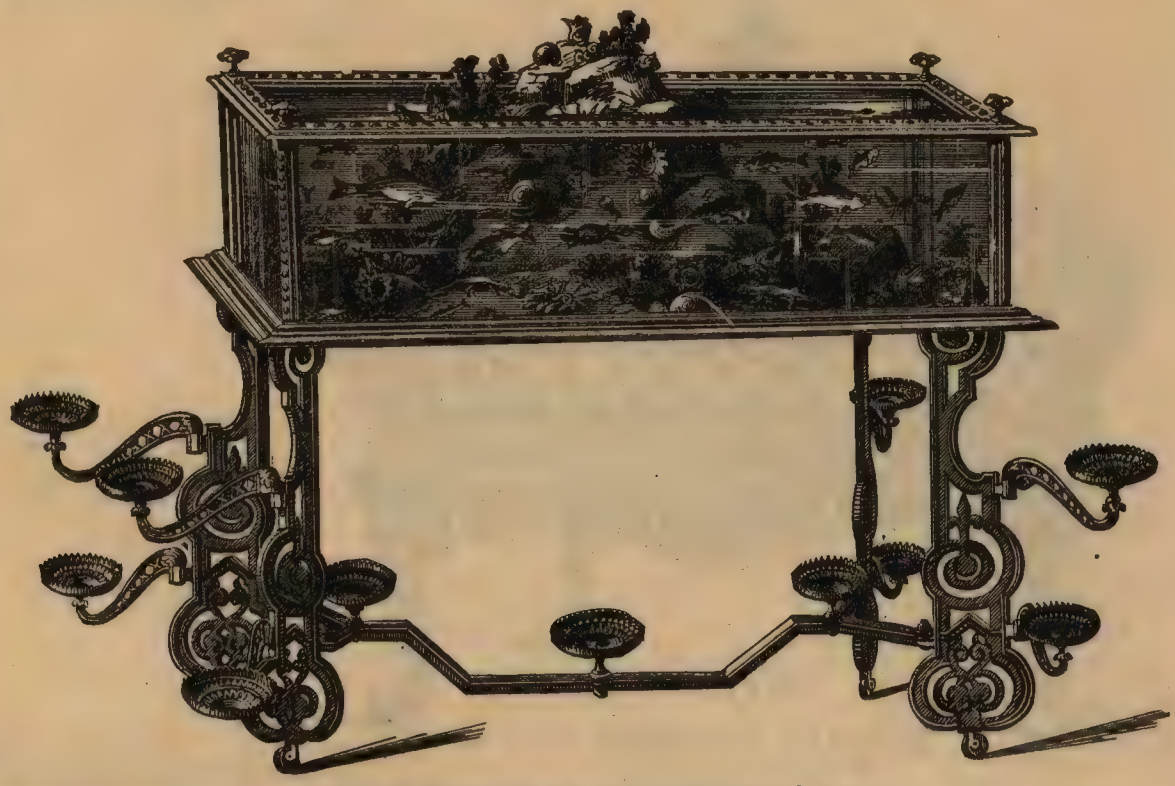
№3.

Send for Special Sheets of Settees and Chairs.

# Aquariums, Vases, Etc.

CROSS.

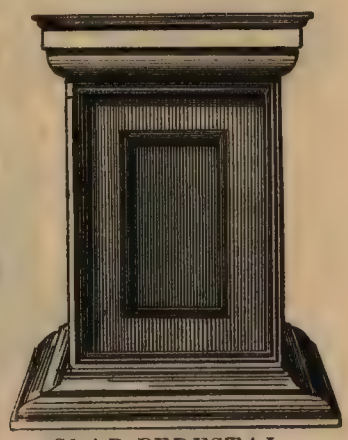
5 ft. high, 2 ft. 10 in. wide.



Send for Special Sheets of Aquariums and Vases.

OCTAGON AQUARIUM.

4 ft. 6 in. high, 2 ft. 7 in. wide.



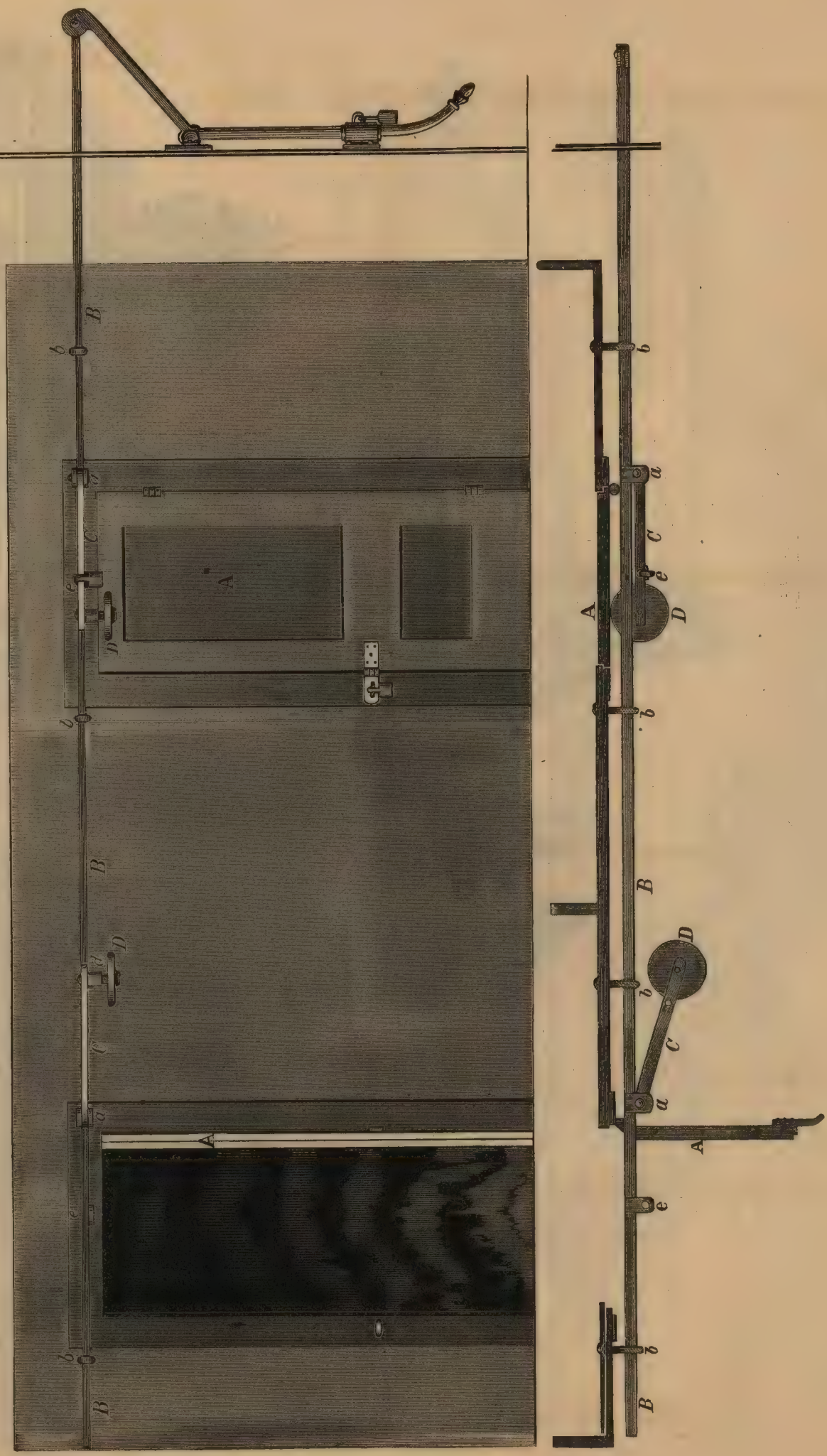
SLAB PEDESTAL.

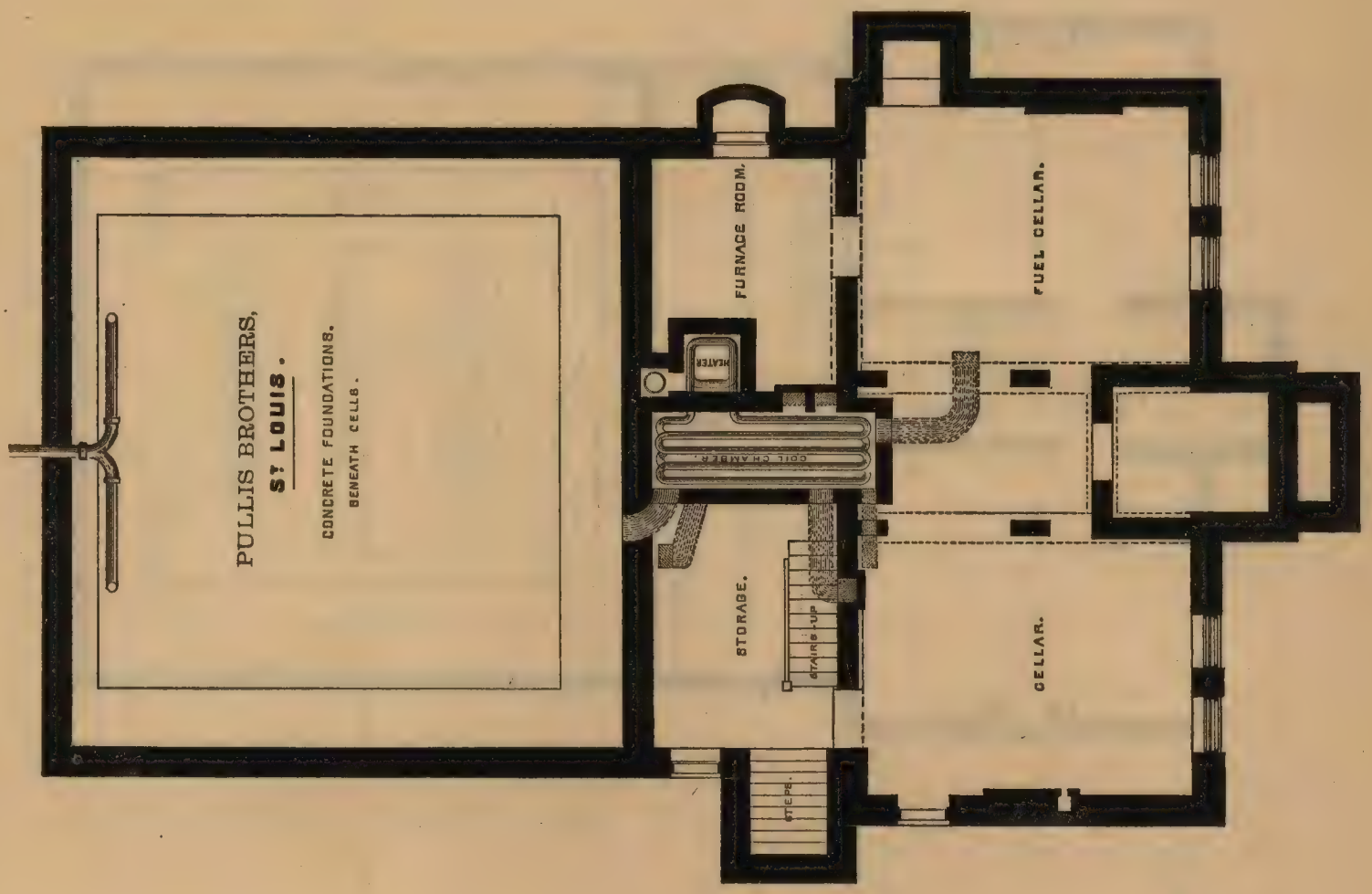
FLUTED VASE.

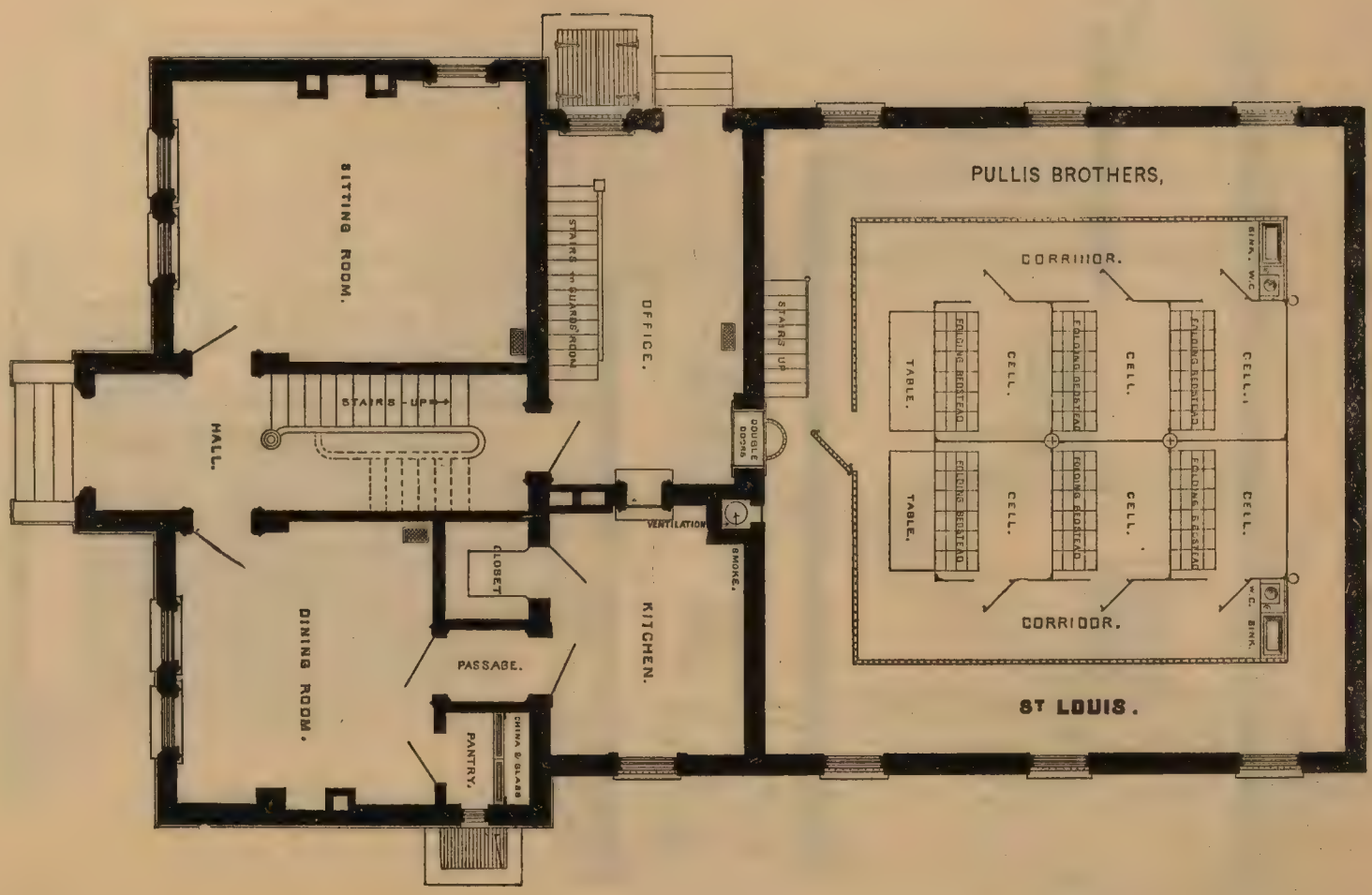
PULLIS BROTHERS, ST. LOUIS.

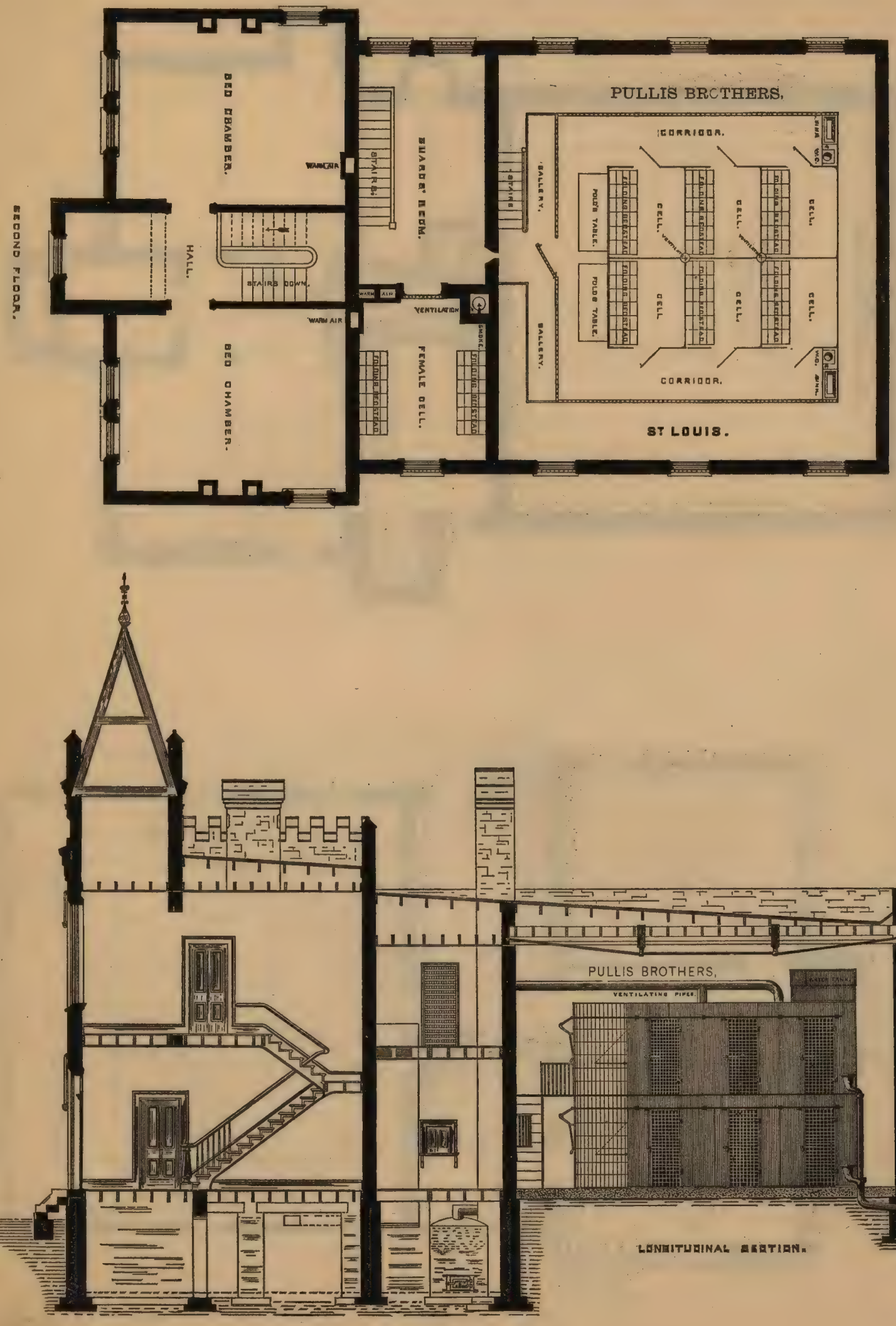
# Bolt Mechanism for Prison Doors.

PATENTED APRIL 22, 1873.




PULLIS BROTHERS,
ST LOUIS.
CONCRETE FOUNDATIONS.
BENEATH CELLS.
FURNACE ROOM.
HEATER
COIL CHAMBER.
FUEL CELLAR.
STORAGE.
STAIRS UP
CELLAR.
STEPS.
BASEMENT.


SITTING ROOM.
STAIRS UP
STAIRS TO GUARDS' ROOM
OFFICE.
HALL.
DOUBLE DOORS
VENTILATION
SMOKE.
CLOSET
PASSAGE.
KITCHEN.
DINING ROOM.
PANTRY.
CHINA & GLASS
STAIRS UP
PULLIS BROTHERS,
CORRIDOR.
SINK. W.C.
TABLE.
FOLDING BEDSTEAD
CELL.
CORRIDOR.
W.C. SINK.
ST LOUIS.
FIRST FLOOR.




LONGITUDINAL SECTION.

# Tables of Strength of Cast Iron Columns.

## BASED UPON "GORDON'S RULES."

The weights are given in tons of 2,000 pounds avoirdupois, which can be borne with safety when the ends of columns are dressed or turned at right angles to their axis.

### ½ Inch Metal.

| LENGTH IN FEET. | DIAMETER IN INCHES. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 8 | 18.1 | 29.22 | 41.80 | 55.32 | 96.45 | 83.95 | 98.70 | 110.65 | 124.76 |
| 10 | 14.5 | 23.32 | 34.35 | 46.55 | 59.65 | 73.37 | 87.5 | 101.69 | 115.80 |
| 12 | 10.62 | 18.92 | 28.47 | 39.37 | 51.32 | 64.07 | 77.32 | 92.51 | 106.40 |
| 14 | 8.17 | 15.45 | 23.90 | 33.57 | 44.37 | 56. | 68.53 | 83.32 | 97.21 |
| 16 | 6.52 | 12.30 | 20.47 | 28.85 | 38.58 | 49.28 | 60.83 | 74.81 | 88 25 |
| 18 | 5.33 | 10. | 16.78 | 25.63 | 33.78 | 43.52 | 54.15 | 67.20 | 79.96 |
| 20 | 4.45 | 8.43 | 14.02 | 21.43 | 30.83 | 38.65 | 48.43 | 60.48 | 72.35 |

### ¾ Inch Metal.

| LENGTH IN FEET. | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 23.70 | 39.68 | 59.05 | 77.97 | 98.95 | 120.58 | 142.60 | 159.58 | 182.13 |
| 10 | 18.38 | 31.45 | 47.40 | 65.30 | 84.62 | 104.97 | 126. | 148.22 | 169.12 |
| 12 | 13.47 | 25.40 | 39.13 | 55. | 72.52 | 91.35 | 111.18 | 135.78 | 155.17 |
| 14 | 10.37 | 20.25 | 32.73 | 46.70 | 62.50 | 79.75 | 98.15 | 121.71 | 141.6 |
| 16 | 8.27 | 16.15 | 27.50 | 40. | 54.20 | 69.93 | 86.90 | 108.19 | 128.62 |
| 18 | 6.77 | 13.25 | 22.50 | 34.97 | 47.35 | 61.63 | 77.25 | 97.37 | 116.23 |
| 20 | 5.65 | 11. | 18.83 | 29.25 | 42.60 | 54.63 | 68.95 | 87.63 | 105.61 |

### 1 Inch Metal.

| LENGTH IN FEET. | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 27.5 | 47.73 | 71.45 | 97.52 | 125.12 | 153.72 | 182.95 | 207.2 | 238.39 |
| 10 | 20.73 | 37.57 | 58. | 81.23 | 106.52 | 133.32 | 161.18 | 191.8 | 221.36 |
| 12 | 15.20 | 30.20 | 47.65 | 68.12 | 90.97 | 115.65 | 141.75 | 175.7 | 203.56 |
| 14 | 11.70 | 23.62 | 39.70 | 57.67 | 78.15 | 100.67 | 124.85 | 154. | 185.76 |
| 16 | 9.32 | 18.82 | 32.80 | 49.30 | 67.60 | 88.05 | 110.30 | 140. | 168 73 |
| 18 | 7.62 | 15.43 | 26.85 | 42.40 | 58.92 | 77.45 | 97.85 | 126. | 152.47 |
| 20 | 6.37 | 12.87 | 22.45 | 35.45 | 52.25 | 68.55 | 87.20 | 113.4 | 138.54 |

### 1¼ Inch Metal.

| LENGTH IN FEET. | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 29.85 | 53.65 | 82.25 | 114.20 | 148.10 | 183.50 | 219 80 | 253.67 | 292.60 |
| 10 | 21.95 | 42. | 66.38 | 94.55 | 125.55 | 158.55 | 193. | 234.82 | 271.70 |
| 12 | 16.10 | 33.60 | 54 33 | 79.00 | 106.82 | 137.10 | 169.27 | 215.10 | 249.85 |
| 14 | 12.40 | 25.82 | 45.10 | 66.65 | 91.47 | 119. | 148.70 | 192.82 | 228. |
| 16 | 9.87 | 20.57 | 36.65 | 56.85 | 78.95 | 103.85 | 131.10 | 171.40 | 207.10 |
| 18 | 8.07 | 16.85 | 30. | 48.15 | 68.67 | 91.17 | 116.10 | 154.26 | 187.15 |
| 20 | 6.75 | 14.07 | 25.07 | 40.25 | 60.07 | 80.55 | 103.30 | 141.40 | 170.05 |

### 1½ Inch Metal.

| LENGTH IN FEET. | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 31.15 | 57.80 | 90.70 | 127.92 | 168.02 | 210.02 | 253.27 | 296. | 341.88 |
| 10 | 22.50 | 45.00 | 72.80 | 105.50 | 141.82 | 180.80 | 221.67 | 274. | 317.46 |
| 12 | 16.50 | 35.85 | 59.33 | 87.77 | 120.25 | 155.82 | 193.85 | 251. | 291.93 |
| 14 | 12.70 | 27.15 | 49.12 | 73.85 | 102.67 | 134.90 | 169.87 | 227. | 266 40 |
| 16 | 10.12 | 21.62 | 39.30 | 62.83 | 88.40 | 117.45 | 149.45 | 202. | 242. |
| 18 | 8.27 | 17.70 | 32.17 | 52.47 | 76.75 | 102.94 | 132.10 | 180. | 218.67 |
| 20 | 6.92 | 14.80 | 26.90 | 43.88 | 66.25 | 90.78 | 117.37 | 165. | 198.69 |

# Table of Strength of Wrought Iron Beams.

## AS GIVEN BY "UNION IRON MILLS."

The weight is given in tons of 2,000 pounds avoirdupois, and is supposed to be equally distributed over the whole Beam.

| | | FEET BETWEEN BEARING. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
| 4 inches | Light | 1.4 | 1.1 | 1. | .9 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Heavy | 1.6 | 1.4 | 1.2 | 1. | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 5 inches | Light | 2.2 | 1.8 | 1.6 | 1.3 | 1.2 | 1.1 | ..... | ..... | ..... | ..... | ..... |
| | Heavy | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | 1.3 | ..... | ..... | ..... | ..... | ..... |
| 6 inches | Light | 3.8 | 3.2 | 2.7 | 2.4 | 2.1 | 1.9 | 1.7 | 1.6 | 1.5 | ..... | ..... |
| | Heavy | 4.5 | 3.8 | 3.2 | 2.8 | 2.5 | 2.3 | 2.1 | 1.9 | 1.7 | ..... | ..... |
| 7 inches | Light | 6.2 | 5.2 | 4.4 | 3.9 | 3.4 | 3.1 | 2.8 | 2.6 | 2.4 | 2.2 | 2.1 |
| | Heavy | 6.6 | 5.5 | 4.7 | 4.1 | 3.7 | 3.3 | 3. | 2.7 | 2.5 | 2.4 | 2.2 |
| 8 inches | Light | 8.2 | 6.8 | 5.9 | 5.1 | 4.6 | 4.1 | 3.7 | 3.4 | 3.2 | 2.9 | 2.7 |
| | Heavy | 9.9 | 8 3 | 7.1 | 6.2 | 5.5 | 5. | 4.5 | 4.1 | 3.8 | 3.5 | 3.3 |
| 9 inches | Light | 10. | 8.6 | 7.3 | 6.4 | 5.8 | 5. | 4.7 | 4.3 | 4. | 3.7 | 3.4 |
| | Heavy | 12.3 | 10.2 | 8.8 | 7.7 | 6.9 | 6.1 | 5.6 | 5.1 | 4.8 | 4.4 | 4.1 |
| 10 inches | Light | 13.9 | 11.6 | 9.9 | 8.7 | 7.7 | 6.9 | 6.3 | 5.8 | 5.4 | 4.9 | 4.6 |
| | Heavy | 16.4 | 13.6 | 11.7 | 10.3 | 9. | 8.2 | 7.5 | 6.8 | 6.3 | 5.9 | 5.5 |
| 12 inches | Light | 20 8 | 17.3 | 14.8 | 13. | 11.6 | 10.4 | 9.5 | 8.7 | 8. | 7 4 | 6.9 |
| | Heavy | 29.1 | 24.2 | 20.8 | 18.2 | 16.2 | 14.6 | 13.2 | 12.1 | 11.2 | 10.4 | 9.7 |
| 15 inches | Light | 32.9 | 27.4 | 23.5 | 20.5 | 18.3 | 16.4 | 14.9 | 13.7 | 12.6 | 11.8 | 11. |
| | Heavy | 42.4 | 35.3 | 30.3 | 26.5 | 23.6 | 21.2 | 19.3 | 17.7 | 16.3 | 15.1 | 14. |

# Weights of Various Material used in Construction of Buildings.

| | | | |
|---|---|---|---|
| Loose Common Cement | Per Cubic Foot, | 54 | lbs. |
| Loose Portland Cement | " " | 96 | " |
| Earth, Loose | " " | 75 | " |
| Clay | " " | 128 | " |
| Clay and Stones | " " | 160 | " |
| Common Window Glass | " " | 157 | " |
| Limestone | " " | 156 | " |
| Marble | " " | 172 | " |
| Quick Lime | " " | 95 | " |
| Masonry, Fresh | " " | 160 | " |
| Masonry, Dry | " " | 125 | " |
| Brickwork | " " | 125 | " |
| Sand, Dry | " " | 98 | " |
| Sand, Wet | " " | 130 | " |
| Slate | " " | 175 | " |
| Ash Timber | " " | 38 | " |
| Chestnut | " " | 41 | " |
| Hickory | " " | 53 | " |
| Maple | " " | 49 | " |
| Oak, Common | " " | 59 | " |
| Oak, White | " " | 51 | " |
| Oak, Red | " " | 38 | " |
| Pine, White | " " | 25 | " |
| Pine, Yellow | " " | 34½ | " |
| Walnut | " " | 38 | " |
| Spruce | " " | 25 | " |

GREEN TIMBERS ONE-HALF HEAVIER THAN DRY.